31(3)

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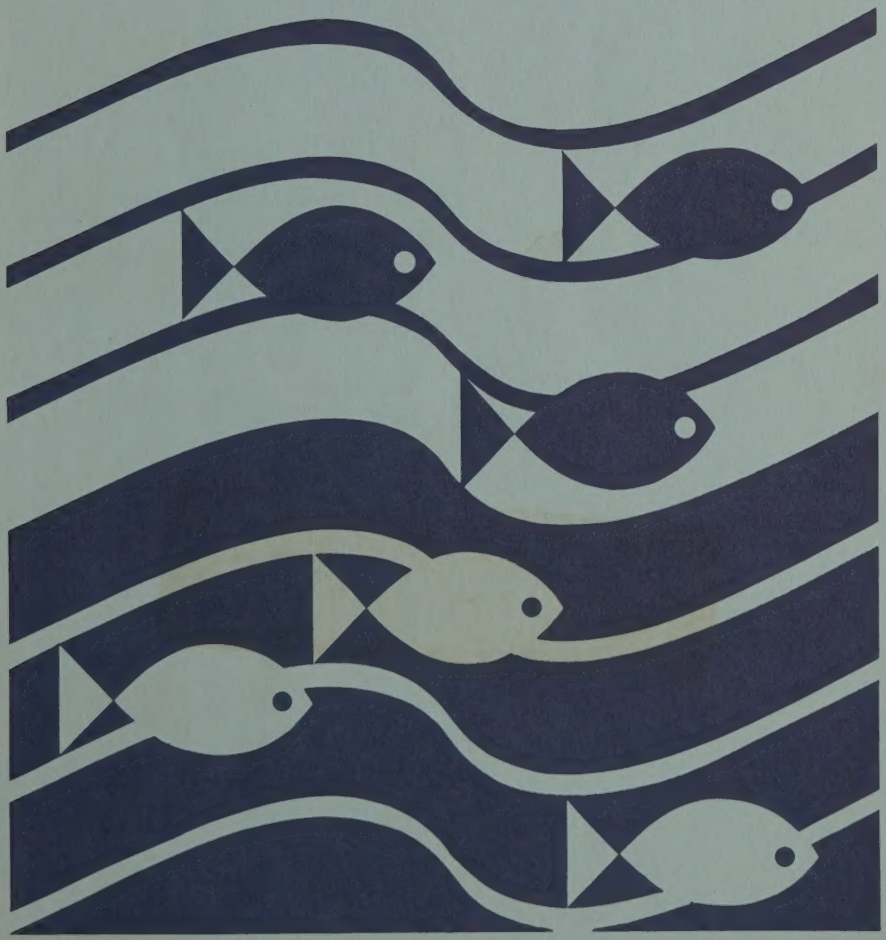

Fisheries Review

Roger Schoumacher, Editor

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Fisheries Review is intended to furnish fishery biologists with abstracts of current literature in sport fishery research and management.

One volume, consisting of four numbers, is issued each year. Each number contains separate Author, Geographic, and Taxonomic, and Subject indexes, and a list of publications screened. Authors who publish in journals not screened for *Fisheries Review*, and who would like their publications included, should submit abstracts to the Editor.

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Fisheries Review

Vol. 31, No. 3 1986

CONTENTS

CULTURE AND PROPAGATION

General Fish Culture..... 1
Trout and Salmon Culture..... 3
Other Anadromous Species Culture..... 5
Warmwater Culture..... 5
Mariculture..... 9
Feeds, Feeding and Nutrition..... 12
Transporting Fish..... 16
Aquariums..... 16
Miscellaneous Culture Techniques and Equipment..... 17

LIMNOLOGY AND OCEANOGRAPHY

General..... 18
Physical..... 18
Chemical..... 19
Benthos..... 19
Plankton..... 19
Primary Production..... 20

MORPHOLOGY, PHYSIOLOGY, GENETICS AND BEHAVIOR

Morphology..... 21
Physiology..... 28
Genetics, Variation Studies, Hybridization..... 58
Behavior..... 63

NATURAL HISTORY

Life Histories - General Works..... 69
Population Studies - Production, Standing Crop, Recruitment. 72
Spawning Habits and Movements, Sex Ratios, Fecundity, etc... 75
Movements, Seasonal and Depth Distribution, etc..... 78
Foods and Feeding..... 79
Age and Growth..... 83
Geographical Distribution, Fish surveys, etc..... 86
Abundance, Factors of; Survival and Mortality..... 90
Identification, Keys, Classification..... 91

PARASITES AND DISEASES

General..... 94

Bacterial..... 96
Fungal..... 99
Protozoan..... 99
Viral..... 101
Other..... 102

POLLUTION AND TOXICOLOGY

Pollution..... 108
Toxicology; Bioassays..... 111
Fish Toxicants..... 120

RESEARCH AND MANAGEMENT

General..... 121
Administration and Planning..... 122
Habitat Alterations..... 122
Harvest, Creel Census, etc..... 124
Regulations..... 126
Fish Control and Removal..... 126
Marking and Tagging..... 126
Stocking and Introductions..... 127
Fishing Gear and Techniques..... 130
Fishways, Fish Passage through Dams, etc..... 131
Mathematical, Statistical Methods and Modeling..... 131
Access..... 132
Lake Management and Research..... 132
River and Stream Management and Research..... 133
Farm Pond and Small Impoundment Management and Research..... 135
Large Impoundment Management and Research..... 135
Estuary Management and Research..... 136
Marine Management and Research..... 136
Utilization of Fishery Products..... 139
Miscellaneous Techniques and Equipment..... 140
Water Use and Conservation..... 141

AUTHOR INDEX (Salmon)..... 143
GEOGRAPHIC INDEX (Yellow)..... 181
SYSTEMATIC INDEX (Blue)..... 187

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[Dep. Zoophysiol., Uppsala Univ., Box 560, S-751 22 Uppsala, Sweden] The behaviour of juvenile Artic charr, *Salvelinus alpinus* (L.). to an abrupt concentration step of L-amino acids, L-alanine and ammonium chloride was studied by fluviarium technique. The emission rates of these substances were studied. Juvenile Arctic charr emit 8.0 x 10^{-4} mol total ammonia-N $kg^{-1}h^{-1}$ and 3.3 x 10^{-5} mol amino acids $kg^{-1}h^{1}$. In behaviour tests the charr avoided 5.6 x 10^{-6} and 5.6 x 10^{-7} M, ammononium chloride. The 17 L-amino acid mixture, ranked as observed in the analyis of emission, was avoided at 4.6 x 10^{-7}M, while 100 times dilution of this value gave neither avoidance nor attraction. The charr avoided L-alanine tested alone at the concentration of 4.6 x 10^{-7} M. Anosmic charr showed neither avoidance nor attraction to the mixture of 17 amino acids tested at 4.6 x 10^{-7} M. The results indicate that ammonia as well as emitted amino acids are not responsible for the olfactory mediated attraction to conspecific odour shown earlier in Arctic charr. On the contrary, these substances may have a negative effect by reducing the strength of attraction.

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[Dep. Anim. Physiol., Catholic Univ., Toernooiveld, 6525 ED Nijmegen, Netherlands] In The Netherlands, the mudminnow *Umbra pygmaea* mainly occurs in water bodies with a pH ranging from 3.5 to 4.0, an alkalinity less than 0.1 meg l^{-1} and a calcium content below 100 umol l^{-1}. The abundance of mudminnows is inversely related to the pH and the presence of predatory fish species. Experimental studies show that *U. pygmaea* is extremely acid-tolerant. Exposure to media with pH values ranging from 4.0 to 7.0 did not cause mortality or significant changes in blood plasma osmotarity and haematocrit. At pH 3.0 no mortality was recorded although a strong decrease in the plasma osmolarity was observed. Exposure to pH 2.8 and calcium concentrations of 100 or 500 umol l^{-1} for 10 days caused 70% and and 40% mortality respectively. The growth, reproduction and feeding of mudminnows are described. Age-growth and length-age relationships were calculated. Gonadal development started between September and January. The highest Gonado Somatic Index was recorded in spring. Spawning occurred from April to May. Fecundity of a sample of females was assessed. Nematocera provided the main item of diet of *U. pygmaea*; the microfaun ingested was dominated by Cladocera. The adaptations of mudminnows to acid environments are discussed.

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[Mar. Sci. Lab., Menai Bridge, Anglesey, North Wales LL59 5EH, Wales] As part of an investigation on the effect of natural oil seeps and oil-bearing substrata on littoral organisms, a study was made on the effect of the presence of freshly exposed Blackstone oil shale from Kimmeridge on the Dorset coast on the behaviour of the common littoral fish the blenny *Blennius pholis* L. in a simulated rock pool habitat. Plastic test chambers were designed with two compartments, one contained sea water and the other contaminated sea water which had been allowed to equilibrate with pieces of Blackstone oil shale and in some experiments further modified by decreasing the pH to simulate natural CO_2 build up in rock pools. The fish were allowed to enter the sea water in either compartment from one of three types of ramp positioned above the surface. The results showed that against appropriate controls, fish which were able to sample a saturated atmosphere avoid coming into contact with equilibrated shale oil-contaminated sea water. As the shale oil content decreased the aversion decreased but the oil still affected the ability of the fish to detect a decrease in pH. Apparently the presence of shale oil leachings in the sea water interferes with the ability of the blenny to discriminate certain characteristics of the physico-chemical environment which would otherwise by avoided.

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[Dep. Anat., Chinese Univ. Hong Kong, Shatin, Hong Kong] *Sarotherodon mossambicus* were fed a chicken manure (60%) supplementary diet for 4 weeks under laboratory conditions, and significantly higher ($P > 0.05$)

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86-003122 CONTINUED concentrations of Mn, Fe, Cu, Pb, and Zn were obtained in the gills of the treated fish. Ultrastructural changes including separation of the epithelium from the pillar cell system and subsequently increasing the blood-water barrier, necrosis of lamellar cells, collapse of lamellar blood spaces, and hyperplasia of interlamellar cells were found in the lamellae of the gills of the treated fish.

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[Freshwater Biol. Assoc., River Lab., East Stoke, Wareham, Dorset BH20 6BB, England] The efficiency of pike removal from a chalkstream trout fishery, by an angling society using electrofishing, was estimated over five successive autumns using mark-recapture methods. It averaged c. 50% for pike aged 1+ years or more. Numbers of 3+ and older pike decreased from $3.7ha^{-1}$ (1980) to $1.4ha^{-1}$ (1984), but there was no corresponding reduction in recruitment success. Both pike immigration and an inverse relationship between natural and fishing mortality could have reduced the effect of the pike culls. The mean weight of 0+ pike increased from 19.4g to 48.2g over the 5 years, but there was no change in the growth rates of older pike. Only the larger pike were able to eat the larger trout stocked, and the reduction in numbers of 3+ and older pike appears to have reduced the predation pressure on the trout population. Angling effort increased more than three-fold over the 5 years studied and rod-catches more than doubled, but catch-per-unit-effort was extremely variable between years. The increased rod catch occurred despite the decrease in numbers of large (>33cm) trout stocked in the spring and early summer. Compared with pre-cull years, the angling society saved about 850 pounds (present day prices) by stocking fewer trout. stocking fewer trout.

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HABITAT ALTERATIONS (CONTINUED)

86-003183 CONTINUED and gas well shell pads, and offshore petroleum platforms were in place in 1984. There were ~ 20,000 ha of open water spoil disposal sites permitted in coastal waters and 1362 bay piers and docks on record. Fourteen jetties were in place or under construction with a bottom area of 228 ha. Oil companies have placed a minimum of 395 oyster shell pads in the bays, each approximately 0.1 ha. There were 181 offshore petroleum platforms and sub-sea installations located in state territorial waters.

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A total of 561,334 smallmouth bass ranging in length from fry to 3.5 inches were stocked into Herrington Lake from 1978-1981 in an attempt at re-establishing smallmouth bass in the lake. For the first 30 years of impoundment, a self-sustaining smallmouth bass fishery existed in the lake. Cove-rotenone data collected from 1948 through 1955 indicated that a viable smallmouth bass population existed during these years. After 1955, only one fingerling-sized (5 inches) smallmouth bass was taken in 1961 and one harvestable-size (≥10 inch) smallmouth bass was collected in 1976. A selective shad removal program conducted from 1956-1959 was at one time thought to be responsible in part for the elimination of smallmouth bass from Herrington Lake. Results of this evaluation study of the smallmouth bass stocking showed that a self-sustaining fishery did not result from the stocking of large numbers of smallmouth bass into the lake. During the 4 years of stocking, smallmouth bass made up a mean of only 0.9% of the total number and 0.7% of the total weight of bass collected during cove-rotenone

STOCKING AND INTRODUCTIONS (CONTINUED)

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FAO of the UN
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Florida: St. Johns' River
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Furukawa-Tanaka, T.
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Galetti P. M., Jr.
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Gray, K. A.
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Great Lakes Fishery Commission
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Haider, S.
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...CONTINUED...
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International Council for the Exploration of the Sea
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MAFF Directorate of Fisheries Research
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Maughan, O. E.
86-002872
86-003297
May, B.
86-002762
May, S. A.
86-002466
Mayer F. L.
86-003107

Mayes, M. A.
86-003128
Mayr, B.
86-002603
Mazeaud, M.
86-002496
McAfee, M. E.
86-003229
McAllister, P. E.
86-002959
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McCabe, G. T., Jr.
86-002690
McCarter, J. A.
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McCarthy, T. K.
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McCarton, B.
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McClellen, S.
86-003307
McClurg, T. P.
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McConnell, F. M.
86-002467
McCraren, J. P.
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McDonald, D. G.
86-002468
McDowell, T.
86-002991
McEachron, L. W.
86-003183
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McEwan, D. R.
86-002860
McFarlane, G. A.
86-003230
McGeachin, R. B.
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86-002162
McGeehan, L. T.
86-002257
McGlade, J. M.
86-003271
McGowan, J. C.
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McGrenra, M. J.
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McHugh, J. L.
86-003336
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McIntyre, A. D.
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McKay, L. R.
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McKaye, K. R.
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McKeown, B. A.
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McKim, J. M.
86-003092
McKlellan, S.
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McLachlan, A.
86-002354
McLaughlin J. J. A.
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McLean, S.
86-002187
McMahon B. R.
86-002567
McMahon, B. R.
86-002568
McPherson, C.
86-003371
Meder, J.
86-003019
Medland, T. E.
86-002350
86-002351
Meehan, W. R.
86-002631
Meier, A. H.
86-002651
Melancon, E.
86-002855
Melius, P.
86-003156
Mellors, A.
86-003130
Menezes, N. A.
86-002917
Menon, K. B.
86-003054
Menzel, B. W.
86-003196
Mergo, J. C., Jr.
86-003029
Meriwether, F. H. II
86-002087
Mesing, C. L.
86-002652
Messager, J. L.
86-002392
Metailler, R.
86-002132
86-002150
Metcalfe, J. D.
86-002258
Metcalfe, N. B.
86-002653
Metzger, R. J.
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Meunier, A.
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Meydrech, E. F.
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Meyer-Rochow, V. B.
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Meyer, D. L.
86-002284
Meyer, F. P.
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Meyer, J. L.
86-002207
Meyn, E. L.
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Miaorong, Y.
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Micha, J.
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Michel, C.
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Michibata, H.
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Middleton, R. W.
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Mikami, T.
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Mikhaylov, V. V.
86-002729
Mikheev, V. N.
86-002789

Millar, R. P.
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Miller, M.
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Miller, R. J.
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Miller, T.
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Miller, W. G.
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Milligan, C. L.
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Millner, R. S.
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Mills, C. A.
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Mills, J. W.
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Milner, G. B.
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Milner, N. J.
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Miltner, M.
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Mims, S. D.
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Mina, M. V.
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Miquelarena, A. M.
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Mironovskiy, A. N.
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Mitchell, S. A.
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Mittal, P. K.
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Miwa, S.
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Miyagawa, M.
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Miyamoto, M.
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Miyazaki, T.
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Mizuarai, Y.
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Moccia, R. D.
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Moerland, T. S.
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Mogil'naya, N. A.
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Mohammed, A. M.
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Mohd Said, M. Z.
86-002810
Mohsin, A. K. M.
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Molnar, K.
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Mommser, T. P.
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Momot, W. T.
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Monaco, S.
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Monostory, Z.
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Montelongo, F. G.
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Montgomery, W. L.
86-002641
Monti, L. B.
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Moon, T. W.
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Moore, C. J.
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Moreira-Filho, O.
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Morgan, G. R.
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Morgan, R. P. II
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Moring, J. R.
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Morris, D. P.
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Morris, I. G.
86-002306
Morrison, C. M.
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Morrison, J. K.
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Morrison, T.
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Mos, W.
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Moser, M.
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Moss, D. D.
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Motyka, K.
86-002427
Moyle, P. B.
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Munaisen, F. D.
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Muir, W. D.
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Mulcany, D.
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Mullier, K.
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Mumaw, L.
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Murakami, T.
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Murphy, B. R.
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Murphy, M. L.
86-003189
Murray, C. B.
86-002221
Murray, K. R.
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Murty, A. S.
86-003132
Musch, M. W.
86-002467
Mushacke, F. M.
86-003051
Musick, J. A.
86-002861
Myers, R. A.
86-002476

...CONTINUED...
Myers, R. A.
86-002477
Naegel, L. C. A.
86-002034
Nagahama, Y.
86-002536
Nagai, Y.
86-002255
Nagle, R. E.
86-003366
Nagy, A.
86-002606
Naka, K.
86-002242
Nakahara, M.
86-003155
Nakai, Y.
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Nakajima, Y.
86-002263
Nakamura, M.
86-003253
Nakamura, N.
86-002264
Nakamura, R.
86-003155
Nakamura, R. M.
86-003030
Nakanishi, T.
86-002478
Nakano, H.
86-002691
Nakao, M.
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Nakashima, T.
86-002670
Nalewajko, C.
86-002208
Narasinga Rao, B. N.
86-002315
Narayan Ram, R.
86-003133
Narf, R. P.
86-003287
Nash, N. T.
86-002499
Naskar, K.
86-002153
Natoli, G.
86-002381
Negus, M. T.
86-003197
Neilson, J. D.
86-002265
Neitzel, D. A.
86-003268
Nellbring, S.
86-002757
Nelson, J. S.
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Nelson, S. G.
86-002078
Neophytou, C. N.
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Neumeyer, C.
86-002655
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Newkirk, G. F.
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Newman, M. W.
86-002154
Newsome, G. E.
86-002266
Newsted, J.
86-003101
Ng, T. B.
86-002479
Nicholson, C.
86-002414
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Nicolette, J. P.
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Nielsen, L. A.
86-002815
Nightingale, J.
86-002054
Nikinmaa, M.
86-002469
86-002481
Nikol'skiy, V. N.
86-002768
Nikonorov, S. I.
86-002608
Nikunen, E.
86-003157
Nilsson, S.
86-002412
Nimi, A. J.
86-003134
Nimmo, I. A.
86-002482
Nishimoto, K.
86-002534
Noble, P.
86-002711
Noltie, D. B.
86-002656
86-003367
Nomura, M.
86-002076
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Noonan, P.
86-003145
Norman, D.
86-003368
Norman, M. D.
86-002782
North, M. J.
86-003124
Northcote, T. G.
86-003244
Nortrupt, D. A.
86-003059
Novikov, G. G.
86-002041
86-003263
Nozaki, M.
86-002483
Nuland, A. M.
86-002422
Nunez-Rodriques, J.
86-002420
O'Connor, D. V.
86-002657
O'Sullivan, J.
86-002385
Oakes, D.
86-002035
Obika, M.
86-002263
86-002267
Odense, P.
86-002451
Ofitserov, M. V.
86-002608
Ogata, H.
86-002155
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Ogilvie, D.
86-002288

Ogle, J.
86-002191
Ogren, L.
86-002802
Oh, Y.
86-003135
Ohta, T.
86-002540
Ojeda, G. M.
86-002122
Okada, H.
86-002055
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Okamura, W. Y.
86-002087
Okazaki, T.
86-002904
Okihiro, M. S.
86-003030
Okino, M.
86-003364
Olah, J.
86-002946
Oldfather, J. M.
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86-002996
Olin, T.
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Olivereau, M.
86-002319
Ollevier, F.
86-002225
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Olsen, K. H.
86-002658
86-002659
Olsen, Y.
86-002209
Olson, J. R.
86-003114
86-003115
Olson, R. E.
86-003023
Olsson, M.
86-003078
Olufemi, B. E.
86-002970
Ona, E.
86-003361
Opuszynski, K.
86-002023
Orlob, G. T.
86-002037
Orsatti, S. D.
86-002777
Osmanov, S. O.
86-002935
Osuga, D. T.
86-002314
86-002315
Otto, C.
86-002772
Ottolenghi, C.
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Ovcharov, O. P.
86-002768
Overstreet, R. M.
86-003108
Oyen, F. G. F.
86-002681
Ozaki, H.
86-003163
86-003164
Pacheco, A. L.
86-002699

...CONTINUED...
Pacheco, A. L.
86-003339
Page, T. L.
86-003268
Pagliarani, A.
86-002487
Pal, B. C.
86-002095
Palazzo, V.
86-003134
Pandare', D.
86-002790
Panek, F. M.
86-003217
Pang, P. K. T.
86-002488
Pang, R. K.
86-002488
Pankhurst, N. W.
86-002489
86-002490
Papaconstantinou, C.
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Papageorgiou, N. C.
86-002692
Papaparaskeva-Papoutsoglou, E.
86-002156
Papas, T. S.
86-002622
Pappantoniou, A.
86-002636
86-002660
Pappas, B. A.
86-002058
Paragamian, V. L.
86-002863
Parenti, L. R.
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86-002269
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Parin, N. V.
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86-002864
Parish, N.
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Park, D. L.
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Park, S. W.
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Parker, J. H.
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Parker, N. C.
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Parker, R. M.
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Parkhurst, L. J.
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Parks, W.
86-003031
Parland, W. K.
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Parsons, J. W.
86-002832
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Parsons, S. M.
86-002297
Pascoe, P. L.
86-002791
Pashchenko, N. I.
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Pasteur, R.
86-003137
Patlak, C. S.
86-002336

Pattillo, P. L.
86-002763
Patton, M.
86-002442
86-002443
Paufler, S.
86-002602
Paulson, G.
86-002309
Pauwels, S. J.
86-003065
Pavanelli, G. C.
86-003012
Pavlov, D. A.
86-002041
Pavlov, D. S.
86-003231
Payne, A. I.
86-002731
Pearcy, W. G.
86-002727
Pedretti, J. W.
86-003254
Peirson, G.
86-002806
Pellegrini, M.
86-003246
Pence, D. B.
86-002937
Penlington, B.
86-003049
Penny, L. T.
86-002646
Percy, L. R.
86-002271
Perez, M. L.
86-002372
Perlman, D. F.
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Perrot, M. N.
86-002491
Perry, S A.
86-002206
Perry, S. F.
86-002243
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86-002733
Perry, W. B.
86-002206
Perry, W. G.
86-002067
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86-003264
Persat, H.
86-002764
Perschbacher, P. W.
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Persson, L.
86-002888
Peter, R. E.
86-002420
86-002490
Peters, M. M.
86-002836
Petersen, J. C.
86-003138
Peterson, B. J.
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Peterson, R. E.
86-002036
86-003114
86-003115
Peterson, R. H.
86-003139
Petr, T.
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Peute, J.
86-002309
Peyrichoux, J.
86-002272
Pfitzer, D. W.
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Philipp, D. P.
86-003306
Phillips, M. J.
86-002056
Phoel, W. C.
86-002732
Piedrahita, R. H.
86-002037
Pierce, B. A.
86-002192
Pierre, J.
86-002272
Pietsch, T. W.
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Pigg, J.
86-002865
Pigott, G. M.
86-002141
86-002165
Piiper, J.
86-002733
Pilgrim, R. L. C.
86-003032
Pillai, M. K. K.
86-003054
Pimentel, R.
86-002632
Piotrowska-Opuszynska, W.
86-002089
Piper, J.
86-002243
Pirini, M.
86-002487
Pisanti, F. A.
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Pitcher, T. J.
86-002661
86-002662
Pivazyan, S. A.
86-002729
Platts, W. S.
86-003277
Plosila, D. S.
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Plumb, J. A.
86-003033
Pomerleau, C.
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Pope, J. A.
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Popova, O. A.
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Popper, A. N.
86-002634
Porter, C. W.
86-002124
Poston, H. A.
86-002157
Potter, A. J.
86-002492
Potter, E. C. E.
86-003219
Potter, I. C.
86-002458
86-002459
86-002814
86-002845

Potts, G. W.
86-002793
Powell, M. J.
86-003246
Powell, R. C.
86-002493
Power, G.
86-002304
Powers, D. A.
86-002494
86-002591
86-002609
86-002682
Powers, L. S.
86-002322
Prentice, J. A.
86-002125
Prescott, S. R.
86-002193
Present, T. M. C.
86-002495
Price, H. A.
86-003140
Price, N. C.
86-003124
Priede, I. G.
86-002195
Prikryl, I.
86-003096
Primmett, D. R. N.
86-002496
Prinsloo, J. F.
86-002090
86-002091
86-002092
86-002096
Prut'ko, V. G.
86-002866
Puffer, H. W.
86-003110
Putintseva, V. A.
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Puviani, A. C.
86-002486
Qizhi, G.
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Quentel, C.
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Querat, B.
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Quigley, M. A.
86-002202
Quignard, J.
86-002818
Quinn, B. D.
86-003030
Quinn, T. J. II
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Rab, P.
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Rabito, F. G., Jr.
86-002753
Rach, J. J.
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Rachlin, J. W.
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86-002838
Radojevic, M.
86-003067
Radonski, G. C.
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Radziej, J.
86-002023
Ragimov, D. B.
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Rahoomah, A.
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Raibaut, A.
86-003027
Railo, E.
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Rajyalakshmi, T.
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Ralph, D. E.
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Ralston, S.
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Ram, R. N.
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Ranck, C. L.
86-002610
Rand, T. G.
86-003034
Randall, D. J.
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Randall, J. E.
86-002907
Rankin, E. T.
86-002663
86-002669
Rao, D. M. R.
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Rao, K. G.
86-003035
Rao, M. C.
86-002499
Rappaport, U.
86-002104
Ratledge, H. M.
86-003218
Ratty, F. J.
86-002616
Rave, M.
86-003137
Raver, D. D.
86-002834
Ravindranath, K.
86-003035
Rawles, S. D.
86-002158
Read, C. J.
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Ream, T. J.
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Reash, R. J.
86-003143
Rechkemmer, G.
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Redding, J. M.
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Reddy, D. M.
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Rees, J. T.
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Regina de Brito Eiras, D.
86-002369
Rego, A. A.
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Rehnberg, B. C.
86-003144
Rehnberg, B. G.
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Rehulka, J.
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Reid, D. M.
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Reid, S. B.
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Reimchen, T. E.
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Reinsnes, T. G.
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Reiter, M. A.
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Relyea, K.
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Renaud, M. L.
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Reperant, J.
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Resh, R. E.
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Reshetnikov, Y. S.
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Reutergardh, L.
86-003078
Reyes, X.
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Rhodes, R. C. III
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Ribeiro, D. M.
86-002752
Ribeiro, S. P.
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Rice, M. E.
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Rice, S. D.
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Richards, A. H.
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Richardson, K.
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Richardson, M. D.
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Richardson, N. L.
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Richarson, R. T.
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Richter, H.
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Riddle, L. M.
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Riegel, J. A.
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Rieman, B. E.
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Riggs, A.
86-002161
Ringe, R. R.
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Ringler, N. H.
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Rintamaki, P.
86-002955
Rio, J. P.
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Rioux, I. A.
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Risley, R.
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Rivier, J. E.
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Rivlin, K. A.
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Roadhouse, D.
86-002058
Roadhouse, S.
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Roald, S. O.
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Robbins, J. A.
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Robbins, S. D.
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Roberge, M. M.
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Roberts-Goodwin, S. C.
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Roberts, B. L.
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Roberts, D. E., Jr.
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Roberts, R. J.
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Robertson, L.
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Robinson, A. R.
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Robinson, E. H.
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Robinson, F. W.
86-003296
Roch, M.
86-003145
Rochefort-Johnson, S. M.
86-003146
Rodero, A.
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Rogano, M. S.
86-002468
Rogatnykh, A. Y.
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Rogers, P. H.
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Rogers, W. A.
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Rogillio, H.
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Rogulska, A.
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Romaire, R. P.
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Romand, R.
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Romano, A.
86-002291
Romanov, A. A.
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Romero, R. C.
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Ronan, M. C.
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Rooks, J. R.
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Rooney, D J.
86-002666
Ropson, I.
86-002609

Rosch, R.
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Rosemark, R.
86-002979
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Rosenblatt, R. H.
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Rosenqvist, G.
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Roshchin, E. A.
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Ross, L. G.
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Ross, S. T.
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Rossberg, K. S.
86-002127
Rothwell, G. N.
86-002118
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Roubal, F. R.
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Rourke, A. W.
86-003038
Rowland, W. J.
86-002667
Rowley, A. F.
86-002408
Roy, S.
86-002095
Royce, W. F.
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Ruiz-Amil, M.
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Texas Chapter of the American Fisheries Society
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Theberge, B.
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U.S. Fish and Wildlife Service
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United States Government Accounting Office
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Whalen, S. C.
86-002212
Wheaton, F. W.
86-002188
86-002196
Wheeler, A.
86-002873
Whillans, T. H.
86-003289
Whitaker, D. J.
86-002938
White, A.
86-002564
White, M. M.
86-002625
86-002678
Whitehead, P. J. P.
86-003368
Whiteside, B. G.
86-002807
Whitmore, D. H.
86-002428
86-002626
Whittington, I. D.
86-003050
Wicker, A. M.
86-002652
Wickwire, R.
86-002860
Wiederholt, M.
86-002565
Wiederholt, T.
86-002565
Wiegand, M. D.
86-002566
Wieland, W.
86-002703
Wiles, M.
86-003009
Wiles, T.
86-002844
Wiley, E. O.
86-002918
Wilhm, J.
86-002199
Wilk, S. J.
86-003354
Wilkes, P. R. H.
86-002567
86-002568
Wilkie, D.
86-002385
Willason, S. W.
86-002213
Willford, W. A.
86-003059
Williams, A.
86-003264
Williams, A. E.
86-002067
Williams, A. M.
86-002088
Williams, H. H.
86-003008
Williamson, J. H.
86-002073
Williamson, R.
86-002474
Williamson, S. C.
86-003180
Willis, C. A.
86-003152
Willis, D. E.
86-003146
Willis, D. W.
86-003312

Wilson, K. C.
86-003185
Wilson, P. T.
86-002569
Wilson, R. P.
86-002142
Wilson, S. J.
86-003067
Windell, J. T.
86-002725
86-003305
Winfield, I. J.
86-002806
Winkler, H.
86-002240
Winstone, A. J.
86-003270
Wirtz, P.
86-002239
Wissing, T. E.
86-002645
Withington-Wray, D. J.
86-002285
Withler, R. E.
86-002543
86-002627
Witkowski, A.
86-002840
86-002874
Wittrock, D. D.
86-003045
Wlodek, J. M.
86-002841
Wolburg, H.
86-002286
Wolf, C. H.
86-003117
Wolf, K.
86-002570
86-002922
Wolff, N. A.
86-002430
86-002571
86-002572
Wong, M. H.
86-003122
Wongratana, T.
86-002919
Wood, C. M.
86-002470
Wood, J.
86-002995
Wood, S. C.
86-002349
Woodhead, R. M. J.
86-003202
Worniallo, E.
86-003126
Wortley, J. S.
86-002711
86-002723
Wrathmell, A.
86-002270
Wren, C. D.
86-003087
Wright, A.
86-002704
Wurts, W.
86-002161
Wyban, J. A.
86-002084
Wyche, C. J.
86-002662
Wyman, R. L.
86-003176
Xinluo, C.
86-002897
Xu, B. H.
86-002966
Yagi, T.
86-002573
Yagita, K.
86-003162
Yamada, F.
86-002968
Yamagami, K.
86-002255
Yamaguchi, Y.
86-002829
86-002830
Yamamoto, T.
86-002997
Yamanaka, H.
86-002413
Yamawaki, H.
86-002574
Yamawaki, K.
86-003163
86-003164
Yamazaki, F.
86-002294
86-002295
Yamazaki, T.
86-002134
Yanez-Arancibia, A.
86-002705
86-002742
Yano, T.
86-002575
Yaron, Z.
86-002450
Yarzhombek, A. A.
86-002159
Yaskawa, K.
86-002673
Yasumoto, S.
86-002950
Yasunaga, N.
86-002950
Yee, R. W.
86-002287
Yeh, Y.
86-002314
Yette, H. E.
86-002158
Yoder, C. O.
86-002875
Yone, Y.
86-002167
Yonezawa, S.
86-002576
Yoshida, M.
86-002601
Yoshida, T.
86-003135
Youmans, N. B.
86-002133
Young, B. H.
86-002241
86-003051
Young, R.
86-002724
86-003355
Youson, J. H.
86-002288
86-002317
86-002508
Yu, J. Y. L.
86-002577
Yuen, H. J.
86-003324

Yunfei, W.
86-002876
Yusupov, O.
86-002935
Yuzhakova, G. G.
86-002729
Zaccone, G.
86-003165
Zadunaisky, J.
86-002455
Zadunaisky, J. A.
86-002323
86-002565
86-002578
Zajdel, R. K.
86-003159
Zalewski, M.
86-003252
Zama, K.
86-002295
Zambriborshch, F. S.
86-003356
Zava, B
86-002585
Zdanowicz, V. S.
86-003083
Ziebell, C. D.
86-002675
86-002809
Zielinski, B. S.
86-002278
Zielinski, P. B.
86-002186
Ziolkoski, B.
86-002133
Zippel, H. P.
86-002509
Ziskowski, J. J.
86-002975
Zitko, V.
86-003278
Zitnan, R.
86-003052
86-003053
Ziyadeh, F. N.
86-002579
Zohar, G.
86-002104
86-002166
Zolotov, O. G.
86-002771
Zuna, Z.
86-003283
Zweig, R. D.
86-002044

Africa
86-002790
86-003173
Africa: Lake Victoria
86-002623
Alabama
86-002033
86-003357
Alabama: Tallapoosa River
86-002703
Alabama: Tombigbee River
86-003358
Alaska
86-002049
86-003189
Alaska: Bristol Bay
86-003324
Alaska: Kuparuk Rivers
86-002201
Aral Sea
86-002935
Arizona
86-002809
Arizona: Alamo Lake
86-002675
Arizona: Colorado River
86-002642
Arkansas
86-003298
Arkansas: Arkansas River
86-003184
Asia
86-003300
Atlantic Ocean
86-002698
Atlantic Ocean, North
86-002560
86-002693
86-002695
86-002699
86-002732
86-002739
86-002747
86-002791
86-002802
86-002847
86-002873
86-003004
86-003085
86-003199
86-003262
86-003346
Atlantic Ocean, North: Gulf of Maine
86-003321
Atlantic Ocean, North: New York Bight
86-002833
86-002838
Atlantic Ocean, North: Norfolk Canyon
86-002861
Atlantic Ocean, North: Wadden Sea
86-002707
Australia
86-002814
86-002892
86-002992
86-003006
86-003209
Bering Sea
86-002722
86-002884
Black Sea
86-002250
86-002709
86-003356
Bolivia: Small Titicaca Lake
86-003283
Borneo
86-002905
Brazil
86-002902
Brazil: Rio Jequitinhonha
86-002917
British Columbia: Queen Charlotte Islands: Sangan River
86-002274
Bulgaria
86-003028
California: Humbolt Cty.: Trinidad Bay
86-002862
California
86-003185
86-003187
California: California Current
86-002213
California: Carson River
86-002860
California: Dillon Beach
86-002780
California: Sacramento-San Joaquin Estuary
86-003314
California: San Joaquin Valley
86-003080
California: Truckee River
86-002860
Canada
86-002846
86-003170
Canada: British Columbia
86-002211
86-002774
Canada: British Columbia: Nanaimo River
86-002938
Canada: Manitoba: Lake Winnipeg
86-003286
Canada: Newfoundland
86-002708
Canada: Northwest Territories
86-002204
86-002214
86-002997
Canada: Northwest Territories: Kakisa Lake
86-002736
Canada: Ontario
86-002205
86-003087
86-003246
Canada: Ontario: Henderson Lake
86-003288
Canada: Ontario: Willand River
86-003010
Canada: Quebec
86-002304
86-002881
Canada: Saskatchewan
86-002889
Canada: Saskatchewan: Cumberland Lake
86-002843
Caribbean Sea
86-002842
Caspian Sea
86-002867
Chesapeake Bay
86-003313
Chile
86-003014
86-003015
China
86-003022
China: Sichuan
86-002903

China: Xizang: Namjagbarwa
86-002876
Colorado
86-003311
Colorado: Alamosa River
86-003190
Colorado: Boulder Cty.
86-002725
Colorado: Boulder Cty: Boulder Creek
86-003291
Colorado: Gunnison River
86-002642
Colorado: Twin Lakes
86-002215
Columbia River Estuary
86-002690
Connecticut
86-002808
Connecticut River
86-002713
Costa Rica
86-002034
Cuba
86-002816
Czechoslovakia
86-003053
Czechoslovakia: Ohre River
86-002852
e-pl
86-002901
East Africa: Rufiji River
86-002731
Egypt
86-002081
Egypt: Lake Brollus
86-003285
England
86-002649
86-002711
86-002791
86-002873
86-002931
86-003003
86-003066
86-003256
86-003372
England: Lake District
86-002716
England: Norfolk Broads
86-002723
England: River Trent
86-002848
England: Severn River Estuary
86-002845
Finland
86-002955
Florida
86-002599
86-002652
86-002685
86-002908
86-003247
Florida: Everglades Natl. Park
86-002798
Florida: Lake Okeechobee
86-003172
Florida: St. Johns' River
86-003172
France
86-002046
86-002116
France: Gulf of Lion
86-002818
France: Rance Estuary
86-002787
Georgia
86-003334
Georgia: Lake Lanier
86-003233
Georgia: Sapelo Island
86-002755
Great Lakes
86-003224
86-003282
Greece
86-002692
Greece: Saronic Gulf
86-002776
Guam
86-002078
Gulf of Mexico
86-003183
86-003212
86-003214
Hawaii
86-002025
86-002097
86-002767
86-002837
Idaho: Lake Pend Oreille
86-002694
Idaho: Salmon River
86-003016
Illinois
86-002584
Illinois: Coles Cty.: Ridge Lake
86-003306
86-003307
Illinois: Illinois River
86-002831
India
86-002126
86-002985
India: River Jamuna
86-003054
Indian Ocean
86-002276
86-002696
86-002851
86-002866
86-002871
Indiana
86-002844
86-002921
Indiana: LaPorte Cty.: Kingsbury State Fish Wildl. Area
86-002868
Iowa
86-002863
86-003196
Iraq
86-002020
86-002190
Iraq: Tartar Reservoir
86-002217
Ireland
86-002923
Irish Sea
86-002560
Israel
86-002028
86-002104
86-002227
Italy
86-002585
Ivory Coast
86-002117
Japan
86-002109
86-002720

...CONTINUED...
Japan
86-002778
86-003253
Japan: Mu River
86-002726
Japan: Saru River
86-002726
Japan: Seto Sea
86-002829
86-002830
Japan: Suruga Bay
86-002700
86-002738
Johnston Atoll
86-002735
Kansas
86-003312
Kentucky
86-002633
Kentucky: Herrington Lake
86-002836
86-003234
Kentucky: Ohio River
86-003210
Kuwait
86-002105
86-002689
86-002728
86-002730
86-002835
86-003205
86-003206
86-003216
86-003342
Lake Erie
86-002797
86-003029
86-003289
Lake Michigan
86-002202
86-003101
Lake Ontario
86-002765
86-002879
86-003070
86-003217
Lake Superior
86-002208
86-002706
86-003195
Lebanon
86-003039
Louisiana
86-002067
86-002077
86-002088
86-002203
86-002599
86-002769
Louisiana: Bayou Sara
86-002683
Louisiana: Grand Isle
86-002855
Maine
86-003292
Maine: Kennebec River
86-003197
Malawi: Lake Malawi
86-002912
Malaysia
86-002810
86-002907
Massachusetts
86-003302
Mediterranean Sea
86-002282

...CONTINUED...
Mediterranean Sea
86-002585
86-002818
Mexico
86-002705
86-002850
Mexico; Southern California
86-003347
Mexico: Gulf of Mexico
86-002742
Michigan; Hunt Cr.
86-003290
Michigan: Chippewa Cty.: St. Mary's River
86-002853
Middle East
86-002022
86-002023
Minnesota
86-002643
86-003211
Mississippi
86-002686
Montana: Flathead River
86-002206
Montana: Kootenai River
86-002206
86-002762
Morocco
86-002030
Nebraska
86-002870
Netherlands
86-003085
New Jersey
86-002026
86-003201
86-003336
New Jersey: Raritan Bay
86-003337
86-003339
86-003354
New Jersey: Round Valley Reservoir
86-002198
New Mexico: San Juan River
86-002642
New York: Black Lake
86-002737
New York: Hudson River
86-002820
New York: Lake Champlain
86-002758
New York: Long Island
86-003057
New York: Niagara River
86-003070
New Zealand
86-003049
New Zealand: Kaikoura
86-002849
New Zealand: Smith Island
86-003032
Nigeria: Lake Kainji
86-003280
Nigeria: Sokoto-Rima River
86-002781
North America
86-002257
86-002465
North Carolina
86-002599
86-002834
86-003218
North Dakota
86-002930

North Sea
86-003004
Northern Ireland
86-002589
Norway
86-002828
86-003363
Ohio river
86-003210
Ohio: Richland Cty.: Clear Fork
86-003143
Ohio: Richland Cty.: Rocky Fork
86-003143
Ohio: Sandusky River
86-002875
Oklahoma
86-002812
86-002872
86-003239
86-003297
Oklahoma: Beaver Cty.
86-002865
Oklahoma: Harper Cty.
86-002865
Oklahoma: Lake Carl Blackwell
86-002199
Oklahoma: Lake Texoma
86-003310
Oman
86-003204
Oregon
86-002727
86-003023
Oregon: Tobe Ck.
86-003191
Pacific Ocean
86-002211
86-002245
86-002691
86-002718
86-002720
86-002722
86-002727
86-002756
86-002761
86-002763
86-002767
86-002774
86-002810
86-002837
86-002854
86-002857
86-002858
86-002893
86-002904
86-002910
86-002911
86-003023
86-003071
86-003293
86-003316
86-003318
86-003347
86-003351
Pacific Ocean, Southeastern
86-002864
Pacific Ocean: California Current
86-002213
Papua New Guinea
86-002704
Pennsylvania
86-002715
86-003296
Peru
86-002854
Philippines
86-002759
Poland
86-002821
86-003252
Poland: Lake Warniak
86-002710
Poland: River Dunajec
86-002840
86-002869
Poland: River Nysa Klodzka
86-002874
Poland: River Peczora
86-002901
Portugal: Lagoon of Aveiro
86-003075
Red Sea
86-003315
Rhode Island
86-002770
Saudi Arabia
86-002021
86-003315
Scotland
86-002882
86-003044
Sierra Leone: Taia River
86-002731
Singapore
86-002112
South Africa
86-002090
86-002091
86-002092
86-002680
86-002800
South Africa: Boskop Dam
86-003048
South Africa: Natal
86-002717
86-002751
South America
86-002924
South Carolina
86-003334
South Carolina: Cooper River
86-002925
Sudan: Dinder Natl. Park
86-002859
Sweden
86-002804
86-003078
Taiwan
86-002029
86-003007
Tennessee
86-003220
Tennessee: Great Smoky Mtns. Natl. Park: Little River
86-003213
Tennessee: Reelfoot Lake
86-003207
Texas
86-002072
86-002121
86-002721
86-002850
86-003183
86-003212
86-003214
86-003238
86-003308
Texas: Galveston Bay
86-002027
Texas: Lake Texoma
86-003310

Texas: San Marcos River
86-002807
Thailand
86-002914
86-002919
86-002998
Tunisia
86-002106
United Kingdom
86-003219
United Kingdon
86-003262
United States
86-003250
United States, North Central
86-003077
United States, Northeastern
86-003065
86-003292
United States, Northwest
86-003169
USSR
86-002250
86-002771
86-002878
USSR: Amur River
86-002697
USSR: Kamchatka
86-002805
USSR: Kamchatka: Ozernaya River
86-002409
USSR: Lake Baikal
86-002389
86-002746
USSR: Lake Chukcha
86-002701
USSR: Latvia
86-002928
USSR: Okhotsk Sea
86-002688
USSR: Sevan
86-002729
USSR: Volga Delta
86-002684
Utah: Flaming Gorge Reservoir
86-002799
Venezuela: Apure River
86-002665
Vermont
86-002192
86-003296
Wadden Sea
86-002707
86-002739
Wales
86-002931
86-003299
Washington
86-002197
86-003181
Washington: East Fork Satsop River
86-002724
Washington: Mount St. Helens
86-002886
Washington: Puget Sound
86-002052
86-003192
86-003203
West Germany: Lahn River
86-003074
West Germany: Rhine River
86-003074
West Virginia: Preston Cty.: Snowy Creek
86-002595
Wisconsin
86-002999
86-003193
Wisconsin: Dane Cty.: Lake Mendota
86-002754
Wisconsin: Lake Superior
86-003195
Wisconsin: Manitowoc Cty.: Bullhead Lake
86-003287
Wisconsin: Wisconsin River
86-003294
Wyoming: Flaming Gorge Reservoir
86-002799
Wyoming: Green River
86-002642
Wyoming: Snowy Range
86-002880

Abramis brama
Age/Growth
86-003276
Digestive System
86-002449
Electrophoresis
86-002600
Embryology
86-002240
Enzymes
86-002449
Length-Weight Relationships
86-002841
Management/Research--General
86-003276
Mortality Rates
86-003276
Nitrogen Metabolism
86-002537
Population Studies
86-003276
Recruitment
86-003276
Skeletal System
86-002250
Temperature
86-002240
86-002537
Variation Studies
86-002250
Acanthoclinus fuscus
Locomotion
86-002638
Acanthomorpha
Taxonomy
86-002913
Acanthopagrus
Bomolochidae
86-003005
Ergasilus
86-003006
Parasites/Diseases
86-003005
86-003006
Parasitic Copepods
86-003005
86-003006
Acanthopagrus australis
Blood Chemistry
86-002504
Inflammatory Response
86-002504
Acanthopagrus cuvieri
Commercial Fishing
86-003342
Creel Census
86-003342
Culture/Propagation
86-002103
86-002105
Egg Collection
86-002105
Fingerling Production
86-002105
Harvest
86-003342
Management/Research--Marine
86-003342
Tank Culture
86-002103
Acanthopagrus latus
Culture/Propagation
86-002105
Egg Collection
86-002105

...CONTINUED...
Acanthopagrus latus
Fingerling Production
86-002105
Population Studies
86-002730
Acipenser
Electrophoresis
86-002608
Acipenser brevirostrum
Culture/Propagation
86-002128
Management/Research--General
86-002128
Acipenser gueldenstaedti
Culture/Propagation
86-002094
Distribution/Factors of
86-002867
Pond Culture
86-002094
Salinity
86-002867
Temperature
86-002867
Acipenser oxyrhynchus
Cell Culture
86-002451
Culture/Propagation
86-002128
Management/Research--General
86-002128
Acipenser stellatus
Culture/Propagation
86-002094
Embryology
86-002244
Pond Culture
86-002094
Temperature
86-002244
Acipenser transmontanus
Age/Growth
86-002066
Culture/Propagation
86-002066
86-002068
Digestive System
86-002312
Economics
86-002068
Enzymes
86-002312
Acipenseridae
Excretory System
86-002237
Kidney
86-002237
Alburnus bipunctatus
Length-Weight Relationships
86-002841
Alopias vulpinus
Foods/Feeding
86-002791
Alosa pseudoharengus
Vision
86-002358
Alosa sapidissima
Abundance/Factors of
86-002713
Flow Regimes
86-002713
Year Class Strength
86-002713
Amia calva
Blood Chemistry
86-002317

...CONTINUED...
Amia calva
Early Development
86-002219
Embryology
86-002218
86-002219
Respiration
86-002399
Steroids
86-002317
Ammocrypta beani
Life History/General
86-002686
Ammodytes
Predator/Prey Relationships
86-002662
Schooling Behavior
86-002662
Anchoa mitchilli
Fish Preservation
86-002252
Otoliths
86-002252
Anguilla anguilla
Blood Chemistry
86-002500
86-002559
Catecholamines
86-002320
86-002514
Cortisol
86-002500
Culture/Propagation
86-002136
86-002137
Diets
86-002137
Endocrinology
86-002424
86-002498
86-002559
Epieimeria anguillae
86-002982
Eulan WA New
86-003124
Feeding Experiments
86-002136
86-002137
Feeds
86-002136
Hydrostatic Pressure
86-002299
86-002514
86-002748
Maturation
86-002498
Myxobolus kotlani
86-002983
Osmoregulation
86-002559
Parasites/Diseases
86-002923
86-002982
86-002983
Pressure Effects
86-002299
Protozoan Diseases
86-002982
86-002983
Reproduction
86-002424
Spawning
86-002748
Spawning Migration
86-002748

...CONTINUED...
Anguilla anguilla
Temperature
86-002672
Temperature Selection
86-002672
Anguilla australis
Cardio-Vascular System
86-002402
Anguilla japonica
Osmoregulation
86-002293
Anguilla rostrata
Aeromonas hydrophila
86-002945
Antimycin
86-003109
Bacterial Diseases
86-002945
Copper Sulfate
86-003109
Diquat
86-003109
Dylox
86-003109
Endocrinology
86-002319
Enzymes
86-002319
Formalin
86-003109
86-003123
Furanace
86-003109
Growth Stimulants
86-002348
Hormones
86-002348
Immune Response
86-002945
Malachite Green
86-003123
Metamorphosis
86-002360
Movements
86-002770
Musculature
86-002360
Osmoregulation
86-002362
Parasites/Diseases
86-002925
86-002927
86-002945
Potassium Permanganate
86-003109
86-003123
Rotenone
86-003109
Salt
86-003109
Anoplopoma fimbria
Age/Growth
86-002827
Aplodinotus grunniens
Lintaxine cokeri
86-003029
Trematodes
86-003029
Aplodinotus grunniens
Parasites/Diseases
86-003029
Apogon
Karyotypes
86-002611
Taxonomy
86-002611

Apogon aroubiensis
Status
86-002907
Taxonomy
86-002907
Apogon nigrofasciatus
Status
86-002907
Taxonomy
86-002907
Apteronotus leptorhynchus
Acoustico-Lateralis System
86-002301
Electrophysiology
86-002301
Archosargus probatocephalus
Karyotypes
86-002599
Arctica islandica
Biomagnification
86-003083
Heavy Metals
86-003083
Hydrocarbons
86-003083
Polychlorinated Biphenyls
86-003083
Trace Metals
86-003083
Aristichthys nobilis
Culture/Propagation
86-002096
Induced Maturation
86-002096
Arius felis
Cage Culture
86-002027
Culture/Propagation
86-002027
Heated Water
86-002027
Power Plant Effluents
86-002027
Artedius
Taxonomy
86-002916
Astyanax bimaculatus
Reproductive System
86-002743
Spawning
86-002743
Atheresthes evermanni
Electrophoresis
86-002610
Taxonomy
86-002610
Atheresthes stomias
Electrophoresis
86-002610
Taxonomy
86-002610
Atherinidae
Calyptospora funduli
86-002977
Parasites/Diseases
86-002977
Protozoan Diseases
86-002977
Atractoscion aequidens
Foods/Feeding
86-002800
Auchenipteridae
Aquariums
86-002179
Culture/Propagation
86-002179
Awaous tajasica
Distribution/Geographical
86-002850
Barbus
Taxonomy
86-002890
Variation Studies
86-002890
Barbus aeneus
Digestion Rates
86-002357
Temperature
86-002357
Barbus barbus
Length-Weight Relationships
86-002841
Barbus holubi
Lernaea barnimiani
86-003048
Parasites/Diseases
86-003048
Parasitic Copepods
86-003048
Barbus luteus
Meristic Studies
86-002217
Barbus meridionalis
Length-Weight Relationships
86-002841
Barbus sharpeyi
Age/Growth
86-002811
Bardus apoensis
Culture/Propagation
86-002021
Bathylagidae
Foods/Feeding
86-002779
Benthophilus
Morphology
86-002273
Blennius normani
Meristic Studies
86-002239
Taxonomy
86-002239
Blennius ocellaris
Meristic Studies
86-002239
Taxonomy
86-002239
Blennius pholis
Excretory System
86-002343
Oil Shale Effluents
86-003120
Blennius riodourensis
Meristic Studies
86-002239
Taxonomy
86-002239
Blicca bjoerkna
Reproduction
86-002554
Sex Ratios
86-002554
Skeletal System
86-002249
Temperature
86-002554
Boesemania microlepis
Taxonomy
86-002919
Boops boops
Age/Growth
86-002818

Brachiopterygian
Skeletal System
86-002891
Taxonomy
86-002891
Brachymystax
Genetic Divergence
86-002580
Brienomyrus niger
Foods/Feeding
86-002781
Campostoma anomalum
Hybridization
86-002595
Capoetobrama kuschakewitschi
Foods/Feeding
86-002796
Caranx melampygus
Foods/Feeding
86-002793
Predator/Prey Relationships
86-002793
Caranx ruber
Age/Growth
86-002816
Digestion Rates
86-002792
Foods/Feeding
86-002792
Carassius auratus
Aeromonas hydrophila
86-002941
Arousal
86-002666
Auditory Senses
86-002639
Bacterial Diseases
86-002941
Endocrinology
86-002437
86-002536
Eulan WA New
86-003124
Hormones
86-002437
86-002489
Industrial Wastes
86-003010
Musculature
86-002574
Nervous System
86-002281
86-002286
Olfaction
86-002509
Osmoregulation
86-002302
86-002455
Parasites/Diseases
86-002941
86-003010
Pigments
86-002339
86-002546
Reproduction
86-002437
86-002489
86-002536
RNA
86-002598
Temperature
86-002574
Tumors
86-003010
Variation Studies
86-002598

...CONTINUED...
Carassius auratus
Vision
86-002281
86-002286
86-002287
86-002546
86-002655
Carassius auratus gibelio
Life History/General
86-002684
Carassius carassius
Blood Chemistry
86-002490
Culture/Propagation
86-002098
Electrophoresis
86-002621
Hybridization
86-002098
Malate Dehydrogenase
86-002621
Nervous System
86-002286
Polyculture
86-002098
Polymorphism
86-002621
Pond Culture
86-002098
Steroids
86-002490
Vision
86-002286
Carassius gibelio langsdorfi
Eggs
86-002256
Pigments
86-002256
Carcharinus
Taxonomy
86-002895
Catla catla
Enzymes
86-002520
Liver
86-002520
Catostomus commersoni
Blood Chemistry
86-002568
Gill Parasites
86-003009
Myxobolus
86-003009
Myxosporea
86-003009
Osmoregulation
86-002567
86-002568
Parasites/Diseases
86-003009
Protozoan Diseases
86-003009
Salinity
86-002567
86-002568
Centropristes melana
Culture/Propagation
86-002145
Diets
86-002145
Feeding Experiments
86-002145
Growth
86-002145
Centropristis striata
Benzo(a)pyrene
86-003099

...CONTINUED...
Centropristis striata
Cadmium
86-003099
Heavy Metals
86-003099
Centroscyllium shickoi
New Species
86-002893
Ceratiidae
Distribution/Geographical
86-002906
Taxonomy
86-002906
Chaetodipterus faber
Cage Culture
86-002027
86-002110
Culture/Propagation
86-002027
86-002110
Heated Water
86-002027
86-002110
Power Plant Effluents
86-002027
86-002110
Chaetodon multicinctus
Parasites/Diseases
86-003030
Tumors
86-003030
Chalcalburnus chalcoides mento
Embryology
86-002240
Temperature
86-002240
Champsocephalus gunnari
Age/Growth
86-002825
Channa argus
Air Breathing
86-002384
Cardio-Vascular System
86-002412
Hypoxia
86-002384
Nervous System
86-002412
Respiration
86-002384
Channa punctatus
Ammonium
86-003141
Ammonium Sulfate
86-003133
Emisan
86-003142
Endosulfan
86-003105
Fertilizers
86-003133
86-003141
Fungicides
86-003142
Insecticides
86-003105
Malathion
86-003105
Myxosporidia
86-002985
Parasites/Diseases
86-002985
Protozoan Diseases
86-002985
Channa striata
Lernaea cyprinacea
86-003035

...CONTINUED...
Channa striata
Parasites/Diseases
86-003035
Parasitic Copepods
86-003035
Chanos chanos
Abundance/Factors of
86-002759
Brood Stock
86-002075
Cage Culture
86-002086
Culture/Propagation
86-002075
86-002084
86-002085
86-002086
Induced Maturation
86-002084
86-002085
Maturation
86-002075
Spawning
86-002759
Characoidei
Dentition
86-002260
Cheirodon pisciculus
Mouth Parts
86-002230
Chermerius nufar
Population Studies
86-002717
Chimaera monstrosa
Gyrocotyle
86-003008
Parasites/Diseases
86-003008
Trematodes
86-003008
Chondrichthys
Body Temperature
86-002305
Chromis notatus
Life History/General
86-002700
Chrysoblephus puniceus
Hermaphroditism
86-002382
Population Studies
86-002717
Chrysophrys auratus
Age/Growth
86-002615
Chrysophrys major
Culture/Propagation
86-002167
Feeding Experiments
86-002167
Feeds
86-002167
Nutrition
86-002167
Cichlasoma aureum
Aquariums
86-002180
Culture/Propagation
86-002180
Cichlasoma citrinellum
Age/Growth
86-002674
Aggressive Behavior
86-002674
Cannibalism
86-002674

...CONTINUED...
Cichlasoma citrinellum
Foods/Feeding
86-002674
Cichlasoma cyanogutatum
Parasites/Diseases
86-002993
Viral Diseases
86-002993
Cichlasoma fenestratum
Foods/Feeding/Selectivity
86-002773
Cichlasoma nigrofaciatum
Parasites/Diseases
86-002993
Viral Diseases
86-002993
Cichlidae
Blood Chemistry
86-002553
Citharicthys stigmaeous
Benzo(a)pyrene
86-003110
Clarias anguillaris
Parasites/Diseases
86-003013
Trematodes
86-003013
Clarias batrachus
Cythion
86-003119
Enzymes
86-002520
Insecticides
86-003119
Liver
86-002520
Organochlorines
86-003119
Organophosphates
86-003119
Clarias gariepinus
Blood Chemistry
86-002525
Endocrinology
86-002511
Reproduction
86-002511
Steroids
86-002511
Clarias lazera
Parasites/Diseases
86-003013
Trematodes
86-003013
Clinocottus
Taxonomy
86-002916
Clinus dorsalis
Digestive System
86-002333
Embryology
86-002333
Clupea harengus
Age/Growth
86-002817
Biomagnification
86-003078
DDT
86-003078
Insecticides
86-003078
Otoliths
86-002224
Polychlorinated Biphenyls
86-003078
Clupea harengus harengus
Lipid Metabolism
86-002560
Colisa fasciatus
Selenium
86-003153
Trace Metals
86-003153
Vanadium
86-003153
Coregonus albula
Culture/Propagation
86-003245
Delayed Hatching
86-003245
Fry Stocking
86-003245
Stocking/Introductions
86-003245
Coregonus autumnalis migratorius
Blood Chemistry
86-002497
Coregonus lavaretus
Cage Culture
86-002057
Culture/Propagation
86-002057
86-002134
86-003243
Delayed Hatching
86-003243
Diets
86-002134
Feeding Experiments
86-002134
Fry Stocking
86-003243
Population Studies
86-002729
Stocking/Introductions
86-003243
Toxic Algae
86-003126
Coregonus muksun
Bacterial Diseases
86-002955
Enteric Redmouth Disease
86-002955
Parasites/Diseases
86-002955
Yersinia ruckeri
86-002955
Coregonus peled
Bacterial Diseases
86-002955
Culture/Propagation
86-002134
Diets
86-002134
Enteric Redmouth Disease
86-002955
Feeding Experiments
86-002134
Parasites/Diseases
86-002955
Yersinia ruckeri
86-002955
Coris julis
Endocrinology
86-002493
Hormones
86-002493
Reproduction
86-002493
Coryphaena equiselis
Age/Growth
86-002837

Coryphaena hippurus
Age/Growth
86-002837
Culture/Propagation
86-002118
86-002163
Diets
86-002163
Feeding Experiments
86-002163
Tank Culture
86-002118
Cottidae
Blood Chemistry
86-002389
Electrophoresis
86-002389
Cottocomephorus inermis
Early Development
86-002746
Spawning
86-002746
Cottus bairdi
Bioenergetics
86-002350
86-002351
Embryology
86-002350
86-002351
Osmoregulation
86-002302
Cottus gobio
Foods/Feeding
86-002772
Predator/Prey Relationships
86-002772
Couesius plumbeus
Distribution/Geographical
86-002870
Crossochilus bamaensis
Dactylogyrus crossocheili
86-003022
Parasites/Diseases
86-003022
Trematodes
86-003022
Ctenopharyngodon idella
Biochemical Composition
86-002549
Culture/Propagation
86-002096
Induced Maturation
86-002096
Nitrogen Metabolism
86-002549
Regeneration
86-002548
Reproductive System
86-002548
Cyclopterus lumpus
Buoyancy Adjustment
86-002637
Cynoscion nebulosus
Culture/Propagation
86-002124
Fingerling Production
86-002124
Management/Research--Marine
86-003212
Pond Culture
86-002124
Spawning
86-002745
Cynoscion xanthulus
Culture/Propagation
86-002125

...CONTINUED...
Cynoscion xanthulus
Induced Maturation
86-002125
Cyprinidae
Aeromonas hydrophila
86-002962
Bacterial Diseases
86-002962
Egg Size
86-002228
Home Range
86-002649
Meristic Studies
86-002228
Orientation/Homing
86-002649
Parasites/Diseases
86-002962
Polyploidy
86-002603
Reproductive System
86-002233
Cyprinion acinaces
Culture/Propagation
86-002021
Cyprinis carpio
Ichthyophthiriasis
86-002971
Ichthyophthirius multifiliis
86-002971
Parasites/Diseases
86-002971
Protozoan Diseases
86-002971
Cyprinodon variegatus
Taxonomy
86-002908
Cyprinodon variegatus hubbsi
Habitat Selection
86-002685
Status/Florida
86-002685
Zoogeography
86-002685
Cyprinus carpio
Aeromonas hydrophila
86-002951
Age/Growth
86-002831
Amino Acids
86-002365
86-002484
Ammonia
86-003152
ATP
86-002397
Bacterial Diseases
86-002951
Biochemical Composition
86-002460
Biomagnification
86-003080
Blood Chemistry
86-002322
86-002365
86-002374
86-002419
86-002484
86-002526
Blood Sampling
86-003046
Bothriocephalus gowkongensis
86-003052
Bothriocephalus opsariichthydis
86-003024

...CONTINUED...
Cyprinus carpio
Cadmium
86-003163
86-003164
Cardio-Vascular System
86-002340
86-002541
Catecholamines
86-002540
Cestodes
86-003024
86-003052
Cortisol
86-002419
Culture/Propagation
86-002076
86-002089
86-002096
86-002151
86-002153
Cyanide
86-003152
Diets
86-002151
Digestive System
86-002432
86-002527
Dinitrobenzene
86-003118
Eggs
86-002256
Electrophoresis
86-002620
Endocrinology
86-002419
86-002450
86-002577
Enzymes
86-002427
86-002526
86-002527
Epitheliocystis
86-002981
Eulan WA New
86-003124
Feeding Experiments
86-002151
86-002153
Feeds
86-002153
Gill Diseases
86-003046
Gyrodactylus schulmani
86-003053
Heavy Metals
86-003163
86-003164
Hormones
86-002450
Ichthyophthirius multifiliis
86-002973
Immune Response
86-002521
86-002575
86-002951
Induced Maturation
86-002076
86-002096
Industrial Wastes
86-003010
Insecticides
86-003080
Iron
86-002322
Lactate Dehydrogenase
86-002620

...CONTINUED...
Cyprinus carpio
Light
86-002076
86-002346
86-002347
Malate Dehydrogenase
86-002619
Maturation
86-002076
86-002346
86-002427
86-002450
Mouth Parts
86-002277
Nitrite
86-003152
Organochlorines
86-003080
Osmoregulation
86-002419
Parasites/Diseases
86-002951
86-002972
86-002973
86-002981
86-002986
86-003010
86-003024
86-003027
86-003046
86-003052
86-003053
Phenols
86-003152
Pigments
86-002256
Piscicides
86-003168
Polyculture
86-002089
Polymorphism
86-002619
86-002620
Pond Culture
86-002089
Protein Synthesis
86-002405
Protozoan Diseases
86-002972
86-002973
86-002981
86-002986
Reproduction
86-002346
86-002347
86-002450
Reproductive System
86-002427
Respiration
86-002340
Rotenone
86-003168
Spawning
86-002346
Sphaerospora
86-002972
Starvation
86-002397
Steroids
86-002151
Taste Reception
86-002277
Temperature
86-002076
86-002340

...CONTINUED...
Cyprinus carpio
Temperature
86-002346
86-002347
86-002397
Toxic Gill Necrosis
86-003046
Trematodes
86-003053
Trypanoplasma borelli
86-002986
Tumors
86-003010
86-003027
Vision
86-002251
86-002573
Whirling Disease
86-002973
Cypselurus heterus doderleini
Activity Patterns
86-002647
Movements
86-002647
Schooling Behavior
86-002647
Cypselurus opisthopus hiraii
Activity Patterns
86-002647
Movements
86-002647
Schooling Behavior
86-002647
Derichthyidae
Morphology
86-002246
Spawning
86-002246
Dicentrarchus labrax
Culture/Propagation
86-002106
86-002116
86-002120
86-002149
86-002150
Enzymes
86-002372
Feeding Experiments
86-002149
86-002150
Fingerling Production
86-002106
Fry Production
86-002120
Lipid Metabolism
86-002487
Nutrition
86-002487
Pituitary
86-002225
Salinity
86-002120
Swimbladder
86-002226
Temperature
86-002120
Diplotaxodon greenwoodi
New Species
86-002912
Dipnorhynchus kurikae
Paleontology
86-002892
Dorosoma petenense
Foods/Feeding
86-002809

...CONTINUED...
Dorosoma petenense
Predator/Prey Relationships
86-002809
Eleginus gracilis
Antifreeze Production
86-002314
86-002315
Embiotoca lateralis
Artificial Reefs
86-003192
Foods/Feeding
86-003192
Embiotocidae
Mouth Parts
86-002253
Emmelichthys nitidus
Life History/General
86-002696
Engraulis encrasicolus
Population Studies
86-002709
Enneacanthus gloriosus
Age/Length Composition
86-002715
Entosphenus tridentatus
Immune Response
86-002483
Epigonus denticulatus
Meristic Studies
86-002245
Epinephelus tauvina
Age/Growth
86-002689
86-002835
Cage Culture
86-002112
Culture/Propagation
86-002105
86-002112
86-002689
Egg Collection
86-002105
Fingerling Production
86-002105
Management/Research--Marine
86-002728
Maturation
86-002689
Population Studies
86-002728
Spawning
86-002689
Epiplatys spilargyreius
Predator/Prey Relationships
86-002790
Eptatretus burgeri
Chromosome Elimination
86-002601
Endocrinology
86-002547
Karyotypes
86-002601
Eptatretus cirrhatus
Cardio-Vascular System
86-002563
Eptatretus stouti
Excretory System
86-002502
Esox americanus vermiculatus
Biochemical Composition
86-002406
Musculature
86-002406
Esox lucius
Aromatic Organohalogens
86-003074

...CONTINUED...
Esox lucius
Biomagnification
86-003074
86-003078
DDT
86-003078
Digestive System
86-002449
Electrofishing
86-003127
Enzymes
86-002449
Eulan WA New
86-003124
Fish Control/Removal
86-003127
Heavy Metals
86-003074
Insecticides
86-003078
Management/Research--Ponds
86-003307
Polychlorinated Biphenyls
86-003078
Predator Control
86-003127
Pulp Mill Effluents
86-003157
Stocking/Introductions
86-003307
Esox masquinongy
Biochemical Composition
86-002406
Management/Research--Ponds
86-003307
Musculature
86-002406
Stocking/Introductions
86-003307
Etheostoma blennioides
Competition
86-002678
Distribution/Seasonal
86-002766
Habitat Selection
86-002645
86-002678
Oxygen
86-002766
Substrate Composition
86-002766
Temperature
86-002766
Etheostoma caeruleum
Competition
86-002678
Distribution/Seasonal
86-002766
Habitat Selection
86-002645
86-002678
Life History/General
86-002683
Oxygen
86-002766
Substrate Composition
86-002766
Temperature
86-002766
Etheostoma cragini
Distribution/Geographical
86-002865
Etheostoma flabellare
Distribution/Seasonal
86-002766
...CONTINUED...
Etheostoma flabellare
Habitat Selection
86-002645
Meristic Studies
86-002257
Oxygen
86-002766
Substrate Composition
86-002766
Taxonomy
86-002257
Temperature
86-002766
Variation Studies
86-002257
Etheostoma juliae
Age/Growth
86-002687
Reproduction
86-002687
Spawning
86-002687
Etheostoma maculatum
Distribution/Geographical
86-002844
Etheostoma spectabile
Competition
86-002678
Habitat Selection
86-002678
Etheostoma tetrazonum
Competition
86-002678
Habitat Selection
86-002678
Etheostoma zonale
Competition
86-002678
Habitat Selection
86-002678
Etmopterus frontimaculatus
Taxonomy
86-002893
Etmopterus schmidti
New Species
86-002893
Etroplus maculatus
Chlorine
86-003154
Eumegistus illustris
Distribution/Geographical
86-002866
Exoglossum maxillingua
Eye-picking
86-002636
86-002660
Mimicry
86-002636
Fundulus
Competition
86-002677
Evolution
86-002918
Taxonomy
86-002918
Fundulus grandis
Baitfish Culture
86-002102
Culture/Propagation
86-002102
86-002123
Pond Culture
86-002123
Taxonomy
86-002908

Fundulus heteroclitus
Age/Growth
86-002839
Amino Acids
86-002571
Blood Chemistry
86-002313
86-002494
86-002578
Cadmium
86-003161
Calcium
86-002488
Chloride Cells
86-002247
86-002466
Competition
86-002839
Eggs
86-002216
Endocrinology
86-002223
86-002488
Enzymes
86-002591
Foods/Feeding
86-002839
Heavy Metals
86-003161
Hormones
86-002488
86-002578
Immune Response
86-002378
Life History/General
86-002682
Light
86-002539
Maturation
86-002387
Osmoregulation
86-002466
86-002571
Rectal Gland
86-002578
Regeneration
86-003161
Reproduction
86-002387
86-002515
Research Test Fish
86-002296
86-003060
Spawning
86-002755
Stress
86-002378
Symposia
86-002682
Temperature
86-002313
86-002539
Thermal Shock
86-002313
Tides
86-002539
Trophic Relationships
86-002784
Variation Studies
86-002216
86-002591
86-002609
Fundulus parvipinnis
Benzo(a)pyrene
86-003110
Fundulus similis
Taxonomy
86-002908
Gadus macrocephalus
Age/Growth
86-002827
Gadus morhua
Biochemical Composition
86-002334
Calcium
86-002334
Condition Factors
86-002342
Enzymes
86-002342
Iron
86-002334
Nutrition
86-002342
Gadus morhua macrocephalus
Liver
86-002234
Gadus morhua marisalbi
Electrophysiology
86-002325
Nervous System
86-002325
Olfaction
86-002325
Galeichthys caerulescens
Culture/Propagation
86-002705
Life History/General
86-002705
Gambusia affinis
Age/Growth
86-002819
Carbofuran
86-003111
Coloration
86-002280
Insecticides
86-003111
Pigments
86-002264
Gambusia gaigei
Status
86-002721
Gasterosteus aculeatus
Distribution/Geographical
86-002853
Endocrinology
86-002309
Life History/General
86-002702
Meristic Studies
86-002274
Social Behavior
86-002667
Spawning
86-002702
Variation Studies
86-002274
Geotria australis
Biochemical Composition
86-002459
Iron
86-002459
Gila atraria
Competition
86-002799
Predator/Prey Relationships
86-002799
Reproduction
86-002404

...CONTINUED...
Gila atraria
Vitellogenin
86-002404
Ginglymostoma cirratum
Isozymes
86-002386
Girardinichthys viviparus
Embryology
86-002275
Gobio gobio
Electrophoresis
86-002620
86-002621
Lactate Dehydrogenase
86-002620
Length-Weight Relationships
86-002841
Malate Dehydrogenase
86-002621
Polymorphism
86-002620
86-002621
Gobiomorphus cotidianus
Cestodes
86-003049
Ligula intestinalis
86-003049
Parasites/Diseases
86-003049
Gobius niger
Neuromasts
86-002254
Gonorynchiformes
Musculature
86-002898
Taxonomy
86-002898
Goodea atripinnis
Electrophoresis
86-002625
Variation Studies
86-002625
Gymnocanthus
Foods/Feeding
86-002805
Gymnocephalus cernuus
Reproductive System
86-002318
Gyrinocheilus aymonieri
Mouth Parts
86-002222
Haplochromis
Electrophoresis
86-002623
Variation Studies
86-002623
Hemichromis bimaculatus
Scales
86-002279
Hemigrammus ulreyi
Aquariums
86-002172
Culture/Propagation
86-002172
Hemitripterus americanus
Cardio-Vascular System
86-002370
Hemitripterus villosus
Eggs
86-002238
Heteropneustes fossilis
Culture/Propagation
86-002095
Enzymes
86-002520
...CONTINUED...
Heteropneustes fossilis
Induced Maturation
86-002095
Liver
86-002520
Spawning
86-002095
Surfactants
86-003165
Hexagrammos lagocephalus
Abundance/Factors of
86-002771
Distribution/Geographical
86-002771
Distribution/Seasonal
86-002771
Distribution/Vertical
86-002771
Hexagrammos otakii
Radionuclides
86-003155
Hexanchus
Morphology
86-002282
Hippoglossus hippoglossus
Eggs
86-002368
Fish Stocks
86-002597
Lipid Composition
86-002368
Variation Studies
86-002597
Hippoglossus stenolepis
Population Studies
86-002734
Predator/Prey Relationships
86-002775
Hucho hucho
Age/Growth
86-002840
Huso huso
Culture/Propagation
86-002094
Embryology
86-002244
Pond Culture
86-002094
Temperature
86-002244
Hypophthalmichthys molitrix
Culture/Propagation
86-002069
86-002089
86-002096
Induced Maturation
86-002069
86-002096
Polyculture
86-002089
Pond Culture
86-002089
Hypsoblennius jenkinsi
Bioenergetics
86-002495
Ichthyomyson unicuspis
Electroreception
86-002503
Ictalurus catus
Age/Growth
86-002820
Life History/General
86-002820
Ictalurus furcatus
Catfish Traps
86-003264

...CONTINUED...
Ictalurus furcatus
Nets/Netting
86-003264
Ictalurus melas
Endocrinology
86-002486
Ictalurus nebulosus
Pheromones
86-002321
Spawning
86-002744
Ictalurus punctatus
Age/Growth
86-002815
Anemia
86-003025
86-003033
Cage Culture
86-002027
Calcium
86-002158
Catfish Traps
86-003264
Culture/Propagation
86-002026
86-002027
86-002070
86-002074
86-002077
86-002093
86-002142
86-002162
86-002169
Diets
86-002162
Distribution/Geographical
86-002843
Economics
86-002077
Enzymes
86-002815
Feeding Experiments
86-002074
86-002142
86-002158
Heated Water
86-002026
86-002027
Ichthyophthiriasis
86-002978
Ichthyophthirius multifiliis
86-002978
Immunization
86-002978
Iron
86-002142
Lipid Metabolism
86-002307
Marketing
86-003357
86-003358
Movements
86-002769
Nets/Netting
86-003264
Nutrition
86-002142
86-002158
86-002162
Nutritional Diseases
86-003025
Parasites/Diseases
86-002978
86-003025
86-003033

...CONTINUED...
Ictalurus punctatus
Polyculture
86-002026
86-002093
Pond Culture
86-002074
86-002093
Power Plant Effluents
86-002026
86-002027
Protein Synthesis
86-002815
Protozoan Diseases
86-002978
Stress
86-002169
Temperature
86-002307
Transportation
86-002169
Vision
86-002231
86-002242
Water Quality
86-002074
Isotiophorus platerus
Biomagnification
86-003071
Heavy Metals
86-003071
Mercury
86-003071
Selenium
86-003071
Kareius bicoloratus
Age/Growth
86-002829
Katsuwonus pelamis
Chromosome Studies
86-002616
Foods/Feeding
86-002800
Labeo capensis
Lernaea barnimiani
86-003048
Parasites/Diseases
86-003048
Parasitic Copepods
86-003048
Labeo umbratus
Lernaea barnimiani
86-003048
Parasites/Diseases
86-003048
Parasitic Copepods
86-003048
Lagodon rhomboides
Cage Culture
86-002027
86-002110
Culture/Propagation
86-002027
86-002110
Foods/Feeding/Selectivity
86-002788
Heated Water
86-002027
86-002110
Karyotypes
86-002599
Power Plant Effluents
86-002027
86-002110
Predator/Prey Relationships
86-002788

Lampetra fluviatilis
Blood Chemistry
86-002469
pH Regulation
86-002469
Respiration
86-002505
Lampetra japonica
Maturation
86-002380
Reproduction
86-002380
Lampetra planeri
Biochemical Composition
86-002458
Lampetra reissneri
Maturation
86-002380
Reproduction
86-002380
Lamprichthys tanganicanus
Aquariums
86-002177
Culture/Propagation
86-002177
Lates calcarifer
Culture/Propagation
86-002126
Parasites/Diseases
86-003001
Pond Culture
86-002126
Swimbladder Stress Syndrome
86-003001
Latimeria chalumnae
Biochemical Composition
86-002535
Nervous System
86-002535
Leiostomus xanthurus
Cage Culture
86-002110
Culture/Propagation
86-002110
Heated Water
86-002110
Power Plant Effluents
86-002110
Lepomis auritus
Foods/Feeding
86-002807
Lepomis cyanellus
Anadonta grandis grandis
86-003017
Cestodes
86-003031
Parasites/Diseases
86-003017
86-003031
Parasitic Molluscs
86-003017
Protocephalus
86-003031
Lepomis humilis
Oil Refinery Effluents
86-003138
Lepomis macrochirus
Acrylamide
86-003117
Ammonia
86-003128
Biomagnification
86-003080
Insecticides
86-003080

...CONTINUED...
Lepomis macrochirus
Learning
86-002670
Management/Research--Ponds
86-002719
Organochlorines
86-003080
Piscicides
86-003168
Population Studies
86-002719
Rotenone
86-003168
Selenium
86-003102
86-003103
Social Behavior
86-002640
Trace Metals
86-003102
Trophic Relationships
86-002719
Lepomis megalotis peltastes
Spawning
86-002749
Leucaspius delineatus
Electrophoresis
86-002621
Malate Dehydrogenase
86-002621
Polymorphism
86-002621
Leuciscus cephalus
Length-Weight Relationships
86-002841
Lichia amia
Foods/Feeding
86-002800
Limanda aspera
Age/Growth
86-002827
Limanda ferruginea
Age/Growth
86-002838
Length-Weight Relationships
86-002838
Limanda limanda
Heavy Metals
86-003004
Iron
86-003004
Parasites/Diseases
86-003004
Limanda yokohamae
Age/Growth
86-002830
Liza abu
pH
86-002289
Salinity
86-002289
Temperature
86-002289
Liza macrolepis
Culture/Propagation
86-002083
86-002105
Egg Collection
86-002105
Fingerling Production
86-002105
Liza saliens
Early Development
86-002261
Reproductive System
86-002261

Lophius budegassa
Musculature
86-002335
Protein Synthesis
86-002335
Lophius piscatorius
Musculature
86-002335
Protein Synthesis
86-002335
Lopholatilus chamaeleonticeps
Fecundity
86-002363
Harvest
86-003334
Hermaphroditism
86-002363
Life History/General
86-003334
Management/Research--Marine
86-003334
Maturation
86-002363
Lota lota
Culture/Propagation
86-002082
Egg Collection
86-002082
Fertility
86-002082
Fertilization
86-002082
Lucania parva
Taxonomy
86-002908
Luciocyprinus
Taxonomy
86-002897
Lutjanus argentimaculatus
Age/Growth
86-002810
Lutjanus bohar
Life History/General
86-002704
Lutjanus coccineus
Age/Growth
86-002689
86-002835
Culture/Propagation
86-002689
Management/Research--Marine
86-002728
Maturation
86-002689
Population Studies
86-002728
Spawning
86-002689
Macquaria ambigua
Algal Infections
86-003026
Parasites/Diseases
86-003026
Macropodus opercularis
Defensive Behavior
86-002635
Electrophoresis
86-002606
Predator/Prey Relationships
86-002635
Macrostomias
Taxonomy
86-002894
Macrouridae
Distribution/Geographical
86-002861

...CONTINUED...
Macrouridae
Distribution/Seasonal
86-002861
Macrourus berglax
Life History/General
86-002698
Population Studies
86-002698
Makaira mazara
Biomagnification
86-003071
Heavy Metals
86-003071
Mercury
86-003071
Selenium
86-003071
Makaira nigricans
Locomotion
86-002349
Respiration
86-002349
Malacocephalus boretzi
New Species
86-002910
Mallotus villosus
Antifreeze Production
86-002344
Salinity
86-002344
Temperature
86-002344
Manacopus falcifer
Fins
86-002268
Marcusenius senegelensis
Foods/Feeding
86-002781
Melanogrammus aeglefinus
Costiasis
86-002984
Ichthyobodo
86-002984
Parasites/Diseases
86-002984
Protozoan Diseases
86-002984
Menticirrhus saxatilis
Life History/General
86-002693
Management/Research--Marine
86-002693
Merluccius australis
Aporocotyle australis
86-003015
Parasites/Diseases
86-003015
Trematodes
86-003015
Merluccius bilinearis
Age/Growth
86-002833
Merluccius productus
Fecundity
86-002756
Micropogon undulatus
Cage Culture
86-002110
86-002111
Culture/Propagation
86-002110
86-002111
86-002115
Heated Water
86-002110

...CONTINUED...
Micropogon undulatus
Polyculture
86-002115
Power Plant Effluents
86-002110
Temperature
86-002111
Micropogonias undulatus
Cage Culture
86-002121
Culture/Propagation
86-002121
Heavy Metals
86-003113
Lead
86-003113
Micropterus coosae
Age/Growth
86-002832
Meristic Studies
86-002832
Micropterus dolomieui
Habitat Selection
86-002633
86-002663
86-002669
Heavy Metals
86-003095
Lead
86-003095
Management/Research--Reservoirs
86-003234
Stocking/Introductions
86-003234
Micropterus punctulatus
Habitat Evaluation
86-003297
Habitat Rating Systems
86-003297
Management/Research--Rivers and Streams
86-003297
Micropterus salmoides
Age/Growth
86-002813
86-002834
Foods/Feeding
86-002675
86-002777
Habitat Selection
86-002633
86-002675
Home Range
86-002652
Hybridization
86-002813
Management/Research--Ponds
86-002719
Orientation/Homing
86-002652
Population Studies
86-002719
Regulations
86-003306
Size Limits
86-003306
Spawning Migration
86-002652
Trophic Relationships
86-002719
Vulnerability of Anglers
86-003306
Micropterus treculi
Ammonia
86-003160

...CONTINUED...
Micropterus treculi
Culture/Propagation
86-002073
Nitrate
86-003160
Nitrite
86-003160
Monocentridae
Distribution/Geographical
86-002900
Fish Lists/Keys
86-002900
Taxonomy
86-002900
Monopterus albus
Endocrinology
86-002479
Hormones
86-002479
Mordacia mordax
Biochemical Composition
86-002458
86-002459
Iron
86-002459
Morone americana
Competition
86-002797
Foods/Feeding
86-002797
Morone chrysops
Age/Growth
86-002836
Culture/Propagation
86-002099
Fry Production
86-002099
Hybridization
86-002099
86-003239
86-003308
Induced Maturation
86-002099
Management/Research--Ponds
86-003308
Management/Research--Reservoirs
86-003239
Predator Introductions
86-003308
Stocking/Introductions
86-003239
Morone saxatilis
Abnormalities
86-002241
Bacterial Diseases
86-002947
86-002952
Brackishwater Culture
86-002067
86-002088
Cestodes
86-003040
Culture/Propagation
86-002065
86-002067
86-002088
86-002099
86-002140
Edwardsiella tarda
86-002947
Enzymes
86-002472
Feeding Experiments
86-002140
Fexibacter columnaris
86-002952

...CONTINUED...
Morone saxatilis
Foods/Feeding
86-002808
Fry Production
86-002099
Healing
86-003040
Hybridization
86-002099
86-003239
86-003308
Induced Maturation
86-002099
Lacistorhynchus tenuis
86-003040
Life History/General
86-002065
Management/Research--General
86-002065
Management/Research--Ponds
86-003308
Management/Research--Reservoirs
86-003239
Nerocila acuminata
86-003051
Parasites/Diseases
86-002947
86-002952
86-003040
86-003051
Parasitic Isopods
86-003051
Pond Culture
86-002067
86-002140
Predator Introductions
86-003308
Stocking/Introductions
86-003239
Supplemental Feeding
86-002140
Temperature
86-002472
Moxostoma carinatum
Distribution/Geographical
86-002875
Moxostoma valenciennesi
Distribution/Geographical
86-002875
Mugil
Culture/Propagation
86-002131
Fertilization/Soil and Water
86-002131
Mugil capito
Culture/Propagation
86-002156
Diets
86-002156
Feeding Experiments
86-002156
Nutrition
86-002156
Mugil cephalus
Cage Culture
86-002111
86-002121
Culture/Propagation
86-002110
86-002111
86-002115
86-002116
86-002121
Heated Water
86-002110

...CONTINUED...
Mugil cephalus
Induced Maturation
86-002561
Polyculture
86-002115
Reproduction
86-002561
Temperature
86-002111
Mugil curema
Salinity
86-002369
Mugilidae
Culture/Propagation
86-002081
Myctophidae
Distribution/Vertical
86-002768
Foods/Feeding
86-002768
Myctophum asperum
Distribution/Geographical
86-002871
Myoxocephalus octodecimspinosus
Blood Chemistry
86-002326
Osmoregulation
86-002328
pH Regulation
86-002326
86-002328
Salinity
86-002328
Myoxocephalus thompsoni
Abundance/Factors of
86-002879
Population Studies
86-002879
Predator/Prey Relationships
86-002879
Myxine glutinosa
Digestive System
86-002375
Endocrinology
86-002371
Enzymes
86-002375
Excretory System
86-002371
Negaprion brevirostris
Foods/Feeding
86-002798
Nematocharax
New Genus
86-002917
Nematocharax venustus
New Species
86-002917
Nematolosa vlaminghi
Age/Growth
86-002814
Condition Factors
86-002814
Nesiarchus nasutus
Distribution/Geographical
86-002858
Nezumia tinro
New Species
86-002910
Notacanthiformes
Distribution/Geographical
86-002851
Morphology
86-002851
Notemigonus crysoleucas
Channel Catfish Reovirus
86-002988

...CONTINUED...
Notemigonus crysoleucas
Chum Salmon Virus
86-002988
Gill Parasites
86-003009
Golden Shiner Virus
86-002988
Myxobolus
86-003009
Myxosporea
86-003009
Parasites/Diseases
86-002988
86-003009
Protozoan Diseases
86-003009
Reovirus 13P2
86-002988
Viral Diseases
86-002988
Nothobranchius
Aquariums
86-002175
Culture/Propagation
86-002175
Notothenia neglecta
Bioenergetics
86-002292
Musculature
86-002292
Nototheniops tchizh
Fecundity
86-002276
Sexual Dimorphism
86-002276
Taxonomy
86-002276
Notropis cornutus
Osmoregulation
86-002302
Notropis leedsi
Spawning
86-002753
Notropis lutrensis
Temperature
86-002465
Noturus
Fish Lists/Keys
86-002846
Noturus insignis
Distribution/Geographical
86-002846
Status
86-002846
Noturus nocturnus
Distribution/Geographical
86-002863
Noturus placidus
Distribution/Geographical
86-002872
Oligocottus
Taxonomy
86-002916
Oncorhychus keta
Culture/Propagation
86-002062
Oncorhynchus
Abundance/Factors of
86-002883
Commercial Fishing
86-003327
Culture/Propagation
86-002047
86-002054
86-002144

...CONTINUED...
Oncorhynchus
Diets
86-002144
DNA
86-002543
Feeding Experiments
86-002144
Filtration Systems
86-002054
Fish Passage
86-003343
Fish Stocks
86-002718
Fishways
86-003343
Foods/Feeding
86-002774
Jurisdiction
86-003316
86-003318
86-003331
Life History/General
86-002679
Magnetic Fields
86-002673
Management/Research--General
86-003169
86-003171
86-003175
86-003320
86-003327
86-003343
86-003351
Management/Research--Marine
86-003316
86-003318
86-003331
Management/Research--Rivers and Streams
86-003293
Orientation/Homing
86-002673
Population Studies
86-002883
Recirculating Systems
86-002054
Restoration of Anadromous Runs
86-003293
Oncorhynchus gorbuscha
Abundance/Factors of
86-002878
Early Development
86-002221
Egg Survival
86-002221
Embryology
86-002221
Fish Stocks
86-002221
Foods/Feeding
86-002688
Life History/General
86-002688
Oil
86-003148
Population Studies
86-002706
86-002878
Oncorhynchus keta
Bacterial Diseases
86-002967
Endocrinology
86-002308
86-002557
Enzymes
86-002295

...CONTINUED...
Oncorhynchus keta
Growth Hormone
86-002308
86-002557
Hormones
86-002294
Immunization
86-002967
Induced Maturation
86-002062
Lipid Composition
86-002534
Musculature
86-002294
86-002295
Nets/Netting
86-002722
Parasites/Diseases
86-002938
86-002967
Population Studies
86-002722
Production
86-002724
Spawning
86-002724
Steroids
86-002295
Vibriosis
86-002967
Oncorhynchus kisutch
Abundance/Factors of
86-002886
Chemoreception
86-002664
Copper
86-003144
Culture/Propagation
86-002050
86-002052
Digestive System
86-002331
Endocrinology
86-002373
Forestry Practices
86-003189
Glucose
86-002392
Habitat Selection
86-003189
Heavy Metals
86-003144
Hormones
86-002551
Lipid Metabolism
86-002392
Liver
86-002473
Management/Research--Rivers and Streams
86-003191
Mercury
86-003144
Movements
86-002763
86-002765
Net-Pen Culture
86-002052
Olfaction
86-003144
Parasites/Diseases
86-002979
Parr-Smolt Transformation
86-002331
86-002392

...CONTINUED...
Oncorhynchus kisutch
Proliferative Kidney Disease
86-002979
Protozoan Diseases
86-002979
Reproduction
86-002373
86-002551
Riparian Habitat
86-002886
Sex Determination
86-002050
Starvation
86-002331
Stream Improvement/General
86-003191
Unisex Populations
86-002050
Zinc
86-003144
Oncorhynchus masou
Cestodes
86-003000
Culture/Propagation
86-002155
Diets
86-002155
Diphyllobothrium latum
86-003000
Feeding Experiments
86-002155
Foods/Feeding
86-002803
Maturation
86-002760
Osmoregulation
86-002438
Parasites/Diseases
86-003000
Parr-Smolt Transformation
86-002438
86-002448
86-002803
Oncorhynchus nerka
Abundance/Factors of
86-002694
Competition
86-002799
Electrophoresis
86-002627
Forecasting
86-003324
Fry Traps
86-003255
Hormones
86-002545
Life History/General
86-002694
Liver
86-002473
Maturation
86-002409
86-002545
Parr-Smolt Transformation
86-002409
Population Studies
86-002409
Predator/Prey Relationships
86-002799
Reproduction
86-002545
Trophic Relationships
86-002694
Variation Studies
86-002627

Oncorhynchus rhodurus
Endocrinology
86-002471
Parr-Smolt Transformation
86-002471
Oncorhynchus tshawytscha
Age/Growth
86-002265
Bacterial Diseases
86-002943
86-002949
Bacterial Kidney Disease
86-002943
Blood
86-002394
Blood Chemistry
86-002394
Cataracts
86-003036
Chlorinated Hydrocarbons
86-003101
Culture/Propagation
86-002049
86-002050
86-002052
86-002518
Dams
86-003267
Distribution/Seasonal
86-002690
Endocrinology
86-002529
Fish Passage
86-003267
Foods/Feeding
86-002690
Habitat Selection
86-002631
86-002690
Handling Mortality
86-002518
Impingement/Entrainment
86-003268
Lake Culture
86-002049
Magnetic Fields
86-002671
Movements
86-002763
86-002765
Net-Pen Culture
86-002052
Nutritional Diseases
86-003036
Orientation/Homing
86-002671
Parasites/Diseases
86-002943
86-002949
86-002979
86-003036
Production
86-002049
Proliferative Kidney Disease
86-002979
Protozoan Diseases
86-002979
Renibacterium
86-002949
Sex Determination
86-002050
Sodium Pentachlophenate
86-002949
Stress
86-002300

...CONTINUED...
Oncorhynchus tshawytscha
Stress
86-002464
86-002518
86-003267
Unisex Populations
86-002050
Otoliths
86-002265
Oncoryhnchus
Eggs
86-002510
Ophiocephalus punctatus
Enzymes
86-002520
Liver
86-002520
Ophiocephalus striatus
Enzymes
86-002520
Liver
86-002520
Parasites/Diseases
86-002998
Viral Diseases
86-002998
Opsanus tau
Enzymes
86-002430
Excretory System
86-002361
86-002430
86-002572
Protein Synthesis
86-002361
Oreochromis aureus
Biomagnification
86-003137
Identification
86-002227
Insecticides
86-003137
Lindane
86-003137
Scales
86-002227
Oreochromis mossambicus
ATP
86-002341
Hormones
86-002341
Osmoregulation
86-002341
Oreochromis niloticus
Anesthetics
86-003162
Ascorbic Acid
86-002160
Aspergillus flavus
86-002970
Biomagnification
86-003137
Culture/Propagation
86-002104
86-002160
Ethanol
86-003162
Eugenol
86-003162
Feeding Experiments
86-002160
Foods/Feeding/Selectivity
86-002773
Fungal Diseases
86-002970

...CONTINUED...

Oreochromis niloticus
Identification
86-002227
Insecticides
86-003137
Lactate Dehydrogenase
86-002353
Lindane
86-003137
Nutrition
86-002160
Parasites/Diseases
86-002970
pH
86-002353
Scales
86-002227
Tank Culture
86-002104
Temperature
86-002353
Oryzias latipes
Cadmium
86-003131
Electrophoresis
86-002613
Heavy Metals
86-003131
Melanophores
86-002263
Pigments
86-002263
Reproductive System
86-002255
Variation Studies
86-002613
Oryzias mekongensis
Karyotypes
86-002914
New Species
86-002914
Osmerus mordax
Spawning
86-002758
Otolighes argenteus
Culture/Propagation
86-002689
Otolithes argenteus
Age/Growth
86-002689
86-002835
Management/Research--Marine
86-002728
Maturation
86-002689
Population Studies
86-002728
Spawning
86-002689
Pachymetopon aeneum
Age/Growth
86-002680
Foods/Feeding
86-002680
Life History/General
86-002680
Spawning
86-002680
Pagellus acarne
Reproduction
86-002501
Steroids
86-002501
Pagellus erythrinus
Foods/Feeding
86-002776
Pagothenia borchgrevinki
Antifreeze Production
86-002314
Melanophores
86-002267
Nervous System
86-002267
Pagrus major
Epitheliocystis
86-002981
Parasites/Diseases
86-002981
Protozoan Diseases
86-002981
Rigor Mortis
86-002413
Parablennius pilicornis
Distribution/Geographical
86-002585
Karyotypes
86-002585
Paralichthys oblongus
Age/Growth
86-002838
Length-Weight Relationships
86-002838
Paralichthys olivaceus
Early Development
86-002236
Paramyxine atami
Enzymes
86-002576
Paranthias furcifer
Nerocila acuminata
86-003034
Parasites/Diseases
86-003034
Parasitic Isopods
86-003034
Paratilapia thomasi
Taxonomy
86-002896
Parma victoriae
Foods/Feeding/Selectivity
86-002782
Territorial Behavior
86-002782
Parophrys vetulus
Distribution/Seasonal
86-002727
Gyrodactylus stellatus
86-003023
Parasites/Diseases
86-003023
Population Studies
86-002727
Trematodes
86-003023
Paulicea lutkeni
Cestodes
86-003012
Jauela glandicephalus
86-003012
Megathylacus brooksi
86-003012
Parasites/Diseases
86-003012
Pelvicachromis pulcher
Aquariums
86-002178
Culture/Propagation
86-002178
Perca flavescens
Competition
86-002797

...CONTINUED...
Perca flavescens
Culture/Propagation
86-002146
Diets
86-002146
Dioxin
86-003115
Egg Predation
86-002266
Eggs
86-002266
Feeding Experiments
86-002146
Light
86-002754
Piscicides
86-003168
Rotenone
86-003168
Spawning
86-002754
Temperature
86-002754
Perca fluviatilis
Abundance/Factors of
86-002888
Age/Growth
86-002821
Ammonia
86-003152
Cardio-Vascular System
86-002421
Competition
86-002888
Cyanide
86-003152
Enzymes
86-002421
Eulan WA New
86-003124
Foods/Feeding/Selectivity
86-002789
Nitrite
86-003152
Phenols
86-003152
Temperature
86-002821
Thermal Pollution
86-002821
Percina evides
Distribution/Factors of
86-002643
Distribution/Geographical
86-002643
Habitat Selection
86-002643
Percina nasuta
Distribution/Geographical
86-002872
Percina palmaris
Life History/General
86-002703
Petrocephalus bovei
Foods/Feeding
86-002781
Petromyzon marinus
Biochemical Composition
86-002458
86-002508
Chemoreception
86-002650
Electroreception
86-002503
Fish Control/Removal
86-003224

...CONTINUED...
Petromyzon marinus
Immune Response
86-002483
Iron
86-002508
Lamprey Control
86-003224
Liver
86-002288
Nervous System
86-002330
Piscicides
86-003224
Regeneration
86-002330
TFM
86-003224
Petromyzontidae
Cardio-Vascular System
86-002271
Phaeoptyx
Karyotypes
86-002611
Taxonomy
86-002611
Phenacostethus trewavase
New Species
86-002905
Phoxinus phoxinus
Length-Weight Relationships
86-002841
Meristic Studies
86-002901
Predator/Prey Relationships
86-002661
Taxonomy
86-002901
Physiculus cynodon
New Species
86-002911
Pimephales promelas
Acrylamide
86-003117
Ammonia
86-003128
86-003159
Flocculants
86-003091
Pentachlorophenol
86-003107
Synthetic Polyelectrolytes
86-003091
Platichthys flesus
Blood Chemistry
86-002379
86-002524
Enzymes
86-002506
Platichthys stellatus
Aromatic Amines
86-003116
Platyrhinoidis triseriata
Electroreception
86-002513
Nervous System
86-002513
Plecoglossus altivelis
Culture/Propagation
86-002617
86-002618
Early Development
86-002235
Fungal Diseases
86-002969
Nets/Netting
86-003253

...CONTINUED...
Plecoglossus altivelis
Parasites/Diseases
86-002969
Phoma
86-002969
Polyploidy
86-002617
86-002618
Triploid Fish
86-002617
86-002618
Pleuronectes platessa
Age/Growth
86-002826
Biochemical Composition
86-002334
Calcium
86-002334
Distribution/Vertical
86-002707
Immune Response
86-002306
Iron
86-002334
Lipid Composition
86-002564
Maturation
86-002826
Mortality Rates
86-002707
86-002739
Movements
86-002707
86-002739
Population Studies
86-002707
86-002739
Poecilia latipinna
Endocrinology
86-002390
86-002391
86-002426
Pituitary
86-002220
Reproduction
86-002390
86-002391
86-002426
86-002522
Spawning
86-002750
Steroids
86-002390
86-002426
Temperature
86-002522
Poecilia mexicana
Baitfish Culture
86-002097
Cannibalism
86-002071
Culture/Propagation
86-002071
86-002097
Pond Culture
86-002097
Poecilia reticulata
Anisoles
86-003147
Carboxylic Acid
86-003147
Carcinogens
86-003136
Cell Culture
86-002451

...CONTINUED...
Poecilia reticulata
Diethylnitrosamine
86-003136
Habitat Selection
86-002656
Heavy Metals
86-003149
Parasites/Diseases
86-003136
Phenols
86-003147
Pigments
86-002339
Tumors
86-003136
Zinc
86-003149
Poecilia vittata
Baitfish Culture
86-002097
Cannibalism
86-002071
Culture/Propagation
86-002071
86-002097
Pond Culture
86-002097
Poeciliidae
Baitfish Culture
86-002107
Culture/Propagation
86-002107
Pogonias cromis
Cage Culture
86-002027
86-002110
86-002121
86-002122
Culture/Propagation
86-002027
86-002080
86-002110
86-002115
86-002121
86-002122
86-002127
Heated Water
86-002027
86-002110
Hybridization
86-002080
Polyculture
86-002115
86-002127
Pond Culture
86-002080
86-002127
Power Plant Effluents
86-002027
86-002110
Pollachius pollachius
Acoustical Methods
86-003361
Swimbladder
86-003361
Pollachius virens
Acoustical Methods
86-003361
Swimbladder
86-003361
Pollimyrus adspersus
Foods/Feeding
86-002781
Polypterus palmas
Nervous System
86-002284

...CONTINUED...
Polypterus palmas
Olfaction
86-002284
Pomacentridae
El Nino
86-002741
Population Studies
86-002741
Reef Fish Communities
86-002741
Pomadasys commersonni
Metabolic Rates
86-002354
Respiration
86-002354
Pomastomus saltatrix
Foods/Feeding
86-002800
Pomatoschistus
Spawning
86-002757
Pomatoschistus microps
Habitat Selection
86-002804
Karyotypes
86-002624
Predator/Prey Relationships
86-002804
Pomatoschistus minutus
Habitat Selection
86-002804
Predator/Prey Relationships
86-002804
Pomoxis annularis
Age/Growth
86-002812
Culture/Propagation
86-002584
Fish Control/Removal
86-003308
Hybridization
86-002584
Management/Research--Ponds
86-003308
Pomoxis nigromaculatus
Culture/Propagation
86-002584
Hybridization
86-002584
Porichthys notatus
Communication
86-002646
Sound Production
86-002646
Spawning
86-002646
Poroderma africanum
Endocrinology
86-002493
Hormones
86-002493
Reproduction
86-002493
Prionace glauca
Distribution/Geographical
86-002691
Enzymes
86-002381
Length-Weight Relationships
86-002691
Life History/General
86-002691
Prionotus carolinus
Identification/Eggs
86-002899
Prionotus evolans
Identification/Eggs
86-002899
Life History/General
86-002695
Management/Research--Marine
86-002695
Pristidae
Aquariums
86-002173
Culture/Propagation
86-002173
Prochilodus scrofa
Maturation
86-002752
Pseudopleuronectes americanus
Digestive System
86-002323
86-002396
86-002467
86-002499
Excretory System
86-002552
Glugea stephani
86-002975
Heavy Metals
86-003093
Mercury
86-003093
Osmoregulation
86-002499
Parasites/Diseases
86-002975
pH Regulation
86-002323
Protozoan Diseases
86-002975
Taurine
86-002429
Ptychocheilus lucius
Culture/Propagation
86-002079
Induced Maturation
86-002079
Pungitius pungitius
Aggressive Behavior
86-002641
Competition
86-002641
Foods/Feeding
86-002641
Pylodictis olivaris
Catfish Traps
86-003264
Nets/Netting
86-003264
Raja
Parasites/Diseases
86-003050
Rajonchocotyle emarginata
86-003050
Trematodes
86-003050
Raja erinacea
Biomagnification
86-003089
Blood Chemistry
86-002352
Cardio-Vascular System
86-002336
Caudal Neurosecretory System
86-002414
Digestive System
86-002425
Eggs
86-002248

...CONTINUED...
Raja erinacea
Enzymes
86-002439
Heavy Metals
86-003089
Induced Maturation
86-002440
Mercury
86-003089
Nervous System
86-002336
86-002480
Reproductive System
86-002440
Raja ocellata
4-Chlorodiphenyl Ether
86-003094
Raja radiata
Phenylxylylethanes
86-003146
Raja rhina
Myxosporea
86-002974
Parasites/Diseases
86-002974
Protozoan Diseases
86-002974
Sphaerospora araii
86-002974
Remora remora
Distribution/Geographical
86-002857
Rhacochilus vacca
Artificial Reefs
86-003192
Foods/Feeding
86-003192
Rhinichthys atratulus
Hybridization
86-002595
Rita rita
Enzymes
86-002520
Liver
86-002520
Rutilus
Vision
86-002272
Rutilus alburnoides
Karyotypes
86-002588
Taxonomy
86-002588
Rutilus rutilus
Abundance/Factors of
86-002888
Ammonia
86-003152
Competition
86-002888
Cyanide
86-003152
Digestive System
86-002449
Enzymes
86-002449
Foods/Feeding/Selectivity
86-002806
Nitrite
86-003152
Phenols
86-003152
Salmo clarki
Flow Regimes
86-002642

...CONTINUED...
Salmo clarki
Habitat Selection
86-002642
Salmo gairdneri
Abundance/Factors of
86-002883
Acrylamide
86-003117
Age/Growth
86-002605
Aldrin
86-003066
Amino Acids
86-002157
Aromatic Hydrocarbons
86-003134
Bacterial Diseases
86-002942
86-002944
86-002954
86-002968
Biochemical Composition
86-002159
86-002411
86-002431
86-002531
Bioenergetics
86-002653
86-002801
Biomagnification
86-003066
Blood Chemistry
86-002310
86-002407
86-002496
86-002555
Cadmium
86-003100
86-003145
Calcium
86-002475
86-002558
Cardio-Vascular System
86-002481
Catecholamines
86-002310
86-002496
Cestodes
86-003049
Chromosome Studies
86-002587
Columnaris Disease
86-002942
Commercial Fishing
86-003327
Competition
86-002653
86-002799
Copper
86-003145
Cortisol
86-002303
86-002311
Culture/Propagation
86-002026
86-002047
86-002048
86-002053
86-002055
86-002059
86-002061
86-002063
86-002064
86-002101
86-002141

...CONTINUED...
Salmo gairdneri
Culture/Propagation
86-002147
86-002157
Currents
86-002801
Cytophaga columnaris
86-002942
Dams
86-003267
Dieldrin
86-003066
Diets
86-002141
86-002147
Digestive System
86-002454
86-002482
Dioxin
86-003114
Diplostomum
86-003044
Distribution/Geographical
86-002904
DNA
86-002543
Dominance
86-002653
Eggs
86-002411
86-002431
86-002510
86-002531
Egtved Virus
86-002996
Electrophoresis
86-002583
86-002590
Electrophysiology
86-002492
Endocrinology
86-002298
86-002311
86-002393
86-002452
86-002453
86-002562
Enzymes
86-002359
86-002418
86-002454
86-002482
86-002583
86-002590
Epitheliocystis
86-003038
Eulan WA New
86-003124
Excretory System
86-002232
86-002337
Exercise
86-002310
86-002470
86-002496
Feeding Experiments
86-002141
86-002147
86-002157
Feeds
86-002147
Fenvalerate
86-003092
Fish Passage
86-003267

...CONTINUED...
Salmo gairdneri
Fish Passage
86-003343
Fish Stocks
86-002718
Fishways
86-003343
Flow Regimes
86-002642
Foods/Feeding
86-002801
Forestry Practices
86-003189
Genetic Markers
86-002593
Genetic Strains
86-002059
86-002590
Gill Parasites
86-003045
Habitat Selection
86-002642
86-002801
86-003189
Heated Water
86-002026
86-002048
Heavy Metals
86-003100
86-003145
Hormones
86-002298
Hydrostatic Pressure
86-002299
Hypoxia
86-002356
Immune Response
86-002968
86-002996
Immunization
86-002944
Induced Maturation
86-002061
Insecticides
86-003066
86-003092
IPN
86-002987
86-002991
86-002994
Jurisdiction
86-003318
Karyotypes
86-002602
Kidney
86-002232
Life History/General
86-002679
Light
86-002061
Ligula intestinalis
86-003049
Lipid Metabolism
86-002159
Liver
86-002473
Management/Research--General
86-003169
86-003171
86-003175
86-003327
86-003343
Management/Research--Marine
86-003318
Marking/Tagging
86-003226

...CONTINUED...
Salmo gairdneri
Movements
86-002059
86-002762
86-002763
86-002904
MYC Genes
86-002622
Nervous System
86-002492
Nutrition
86-002152
86-002157
86-002159
Olfaction
86-002278
Osmoregulation
86-002407
86-002468
Otoliths
86-002475
Parasites/Diseases
86-002942
86-002944
86-002954
86-002968
86-002979
86-002987
86-002991
86-002994
86-002996
86-003018
86-003038
86-003044
86-003045
86-003049
Parasitic Copepods
86-003045
Pentachlorophenate
86-003150
pH
86-002311
Pigmenters
86-002063
86-002064
86-002101
Piscicides
86-003104
Polyculture
86-002026
Population Studies
86-002883
Power Plant Effluents
86-002026
86-002048
Predator/Prey Relationships
86-002799
Pressure Effects
86-002299
Proliferative Kidney Disease
86-002979
86-003018
Protein Synthesis
86-002159
Protozoan Diseases
86-002979
Pyrethroids
86-003092
Reproduction
86-002332
86-002452
86-002453
86-002562
Research Test Fish
86-002570

...CONTINUED...
Salmo gairdneri
Rotenone
86-003104
Salinity
86-002418
Salmincola californiensis
86-003045
Sex Determination
86-002055
Sex Reversal
86-002055
Social Behavior
86-002592
Spawning
86-002452
86-002453
Spawning Cycle Regulation
86-002053
Starvation
86-002418
Stress
86-002311
86-002481
86-003267
Suspended Solids
86-003064
Taxonomy
86-002904
Telemetry
86-003226
Temperature
86-002053
86-002061
86-002316
86-002337
86-002445
86-002555
86-002801
Thermal Shock
86-002316
86-002445
Trematodes
86-003044
Vibrio anguillarum
86-002968
Viral Diseases
86-002987
86-002991
86-002994
86-002996
Vitamins
86-002152
Vitellogenin
86-002332
Yersinia ruckeri
86-002944
86-002954
Zinc
86-003145
Salmo mykiss
Distribution/Geographical
86-002904
Karyotypes
86-002596
Movements
86-002904
Taxonomy
86-002904
Salmo penshinensis
Karyotypes
86-002596
Salmo salar
Abnormalities
86-002604
Abundance/Factors of
86-002881

...CONTINUED...
Salmo salar
Abundance/Factors of
86-002882
86-003186
Age/Growth
86-002824
86-002828
86-002882
Bacterial Diseases
86-002955
Biochemical Composition
86-002485
Competition
86-002824
Enteric Redmouth Disease
86-002955
Flow Regimes
86-002882
Forestry Practices
86-003186
Fry Stocking
86-002881
IHN
86-002995
Lipid Composition
86-002566
Management/Research--General
86-003170
Management/Research--Rivers and Streams
86-002824
86-003292
Maturation
86-002290
86-002304
86-002476
86-002477
Movements
86-002708
Osmoregulation
86-002456
Parasites/Diseases
86-002604
86-002955
86-002995
Parr-Smolt Transformation
86-002456
pH
86-003139
Population Studies
86-002708
86-002716
86-003363
Precocious Males
86-002476
Precocious Maturation
86-002477.
Reproduction
86-002444
86-002566
Restoration of Anadromous Runs
86-003292
Spawning
86-003363
Spinal Deformities
86-002604
Stocking/Introductions
86-002824
86-002881
Substrate Composition
86-002882
Temperature
86-002376
86-002444
86-002882

...CONTINUED...
Salmo salar
Thermal Shock
86-002376
Viral Diseases
86-002995
Vitellogenin
86-002444
Yersinia ruckeri
86-002955
Salmo trutta
Abundance/Factors of
86-003186
Age/Growth
86-002692
86-002824
Bacterial Diseases
86-002942
Columnaris Disease
86-002942
Competition
86-002824
Culture/Propagation
86-002045
Cytophaga columnaris
86-002942
Eggs
86-002510
Electrophoresis
86-002583
86-002589
Enzymes
86-002583
Fecundity
86-002692
Flow Regimes
86-002642
Forestry Practices
86-003186
Habitat Selection
86-002642
Hybridization
86-002045
Life History/General
86-002692
Management/Research--Rivers and Streams
86-002824
86-003193
86-003299
Maturation
86-002692
Parasites/Diseases
86-002942
86-002990
Population Genetics
86-002589
Population Studies
86-003363
Riparian Habitat
86-003193
Spawning
86-003363
Stocking/Introductions
86-002824
Trout Stream Management
86-003193
Viral Diseases
86-002990
Viral Hemorrhagic Septicemia
86-002990
Salmonidae
Aeromonas salmonicida
86-002940
86-002960
Bacterial Diseases
86-002940

...CONTINUED...
Salmonidae
Bacterial Diseases
86-002960
Blood Chemistry
86-002528
86-002530
Cage Culture
86-002056
Cortisol
86-002530
Culture/Propagation
86-002046
86-002056
86-002143
Dams
86-003270
Endocrinology
86-002556
Fish Hatchery Effluents
86-002056
Fish Passage
86-003270
Fishways
86-003270
Furunculosis
86-002960
Growth Hormone
86-002556
Immune Response
86-002940
Immunization
86-002940
Management/Research--
86-003351
Management/Research--General
86-003303
86-003320
Management/Research--Rivers and Streams
86-003303
Nutrition
86-002143
Parasites/Diseases
86-002931
86-002940
86-002960
Population Studies
86-003303
Renibacterium salmoninarum
86-002940
Stress
86-002530
Triploid Fish
86-002586
Ulcer Disease
86-002960
Vibrio anguillarum
86-002940
Yersinia ruckeri
86-002940
Salvelinus alpinus
Age/Growth
86-002822
Amino Acids
86-002659
Cestodes
86-003019
Chemoreception
86-002658
Communication
86-002659
Electrophoresis
86-002658
Eubothrium salvelini
86-003019

...CONTINUED...
Salvelinus alpinus
IPN
86-002997
Olfaction
86-002659
Parasites/Diseases
86-002997
86-003019
Viral Diseases
86-002997
Salvelinus fontinalis
Abundance/Factors of
86-002880
86-003186
Aggressive Behavior
86-002641
Cadmium
86-003106
Competition
86-002641
Culture/Propagation
86-002045
86-002051
86-002058
Exercise
86-002051
Feeding Experiments
86-002051
Flow Regimes
86-002642
Food Conversion Efficiency
86-002051
Foods/Feeding
86-002641
Forestry Practices
86-003186
Gradient
86-002880
Growth
86-002051
Habitat Selection
86-002642
Heavy Metals
86-003106
Hybridization
86-002045
Management/Research--Rivers and Streams
86-003193
86-003290
Parasites/Diseases
86-003021
Population Studies
86-002725
Riparian Habitat
86-003193
Sanguinicola fontinalis
86-003021
Sedimentation
86-003290
Trematodes
86-003021
Trout Stream Management
86-003193
Salvelinus leucomaenis
Foods/Feeding
86-002778
Life History/General
86-002701
Salvelinus malma
Forestry Practices
86-003189
Habitat Selection
86-003189
Naphthalene
86-003158

...CONTINUED...
Salvelinus malma
Oil
86-003158
Temperature
86-003158
Toluene
86-003158
Salvelinus mnamycush
Biomagnification
86-003059
Salvelinus namaycush
Culture/Propagation
86-002060
DDT
86-003059
Dieldrin
86-003059
Eggs
86-002510
Insecticides
86-003059
Management/Research--Lakes
86-003246
Polychlorinated Biphenyls
86-003059
Rearing Density
86-002060
Stocking/Introductions
86-003246
Survival
86-003246
Temperature
86-002657
Temperature Selection
86-002657
Sardina pilchardus
Egg Size
86-002229
Sardinops melanosticta
Population Studies
86-002720
Sarocheilichthys variegatus
Eggs
86-002256
Pigments
86-002256
Sarotherodon galilaeus
Identification
86-002227
Scales
86-002227
Sarotherodon karomo
Aquariums
86-002176
Culture/Propagation
86-002176
Sarotherodon mossambicus
Imprinting
86-002668
Manure
86-003122
Schizothorax heterochilus
New Species
86-002903
Sciaenops ocellata
Cage Culture
86-002110
Culture/Propagation
86-002110
86-002114
Heated Water
86-002110
Induced Maturation
86-002114
Pond Culture
86-002114

...CONTINUED...
Sciaenops ocellata
Power Plant Effluents
86-002110
Sciaenops ocellatus
Culture/Propagation
86-002080
86-002135
86-002168
86-002170
Diets
86-002135
Feeding Experiments
86-002135
Handling Mortality
86-002168
86-002170
Hybridization
86-002080
Management/Research--Marine
86-003238
Nutrition
86-002135
Pond Culture
86-002080
Stocking/Introductions
86-003238
Stress
86-002168
86-002170
Supplemental Stocking
86-003238
Scomber scombrus
Population Studies
86-002747
Spawning
86-002747
Scophthalmus maximus
Culture/Propagation
86-002108
86-002113
86-002116
Egg Production
86-002108
Feeding Experiments
86-002132
Fish Kills
86-002113
Lipid Metabolism
86-002132
Mortality Factors
86-002113
Nutrition
86-002132
Tank Culture
86-002108
Scyliorhinus canicula
Bioenergetics
86-002292
Blood
86-002270
Blood Chemistry
86-002408
Gills
86-002258
Musculature
86-002292
86-002474
Nervous System
86-002285
86-002474
Respiratory System
86-002258
86-002538
Scyliorhinus stellaris
Gills
86-002243

...CONTINUED...
Scyliorhinus stellaris
Gills
86-002733
Sebastes maliger
Artificial Reefs
86-003192
Foods/Feeding
86-003192
Sebastes oculatus
Parasites/Diseases
86-003037
Parasitic Copepods
86-003037
Pennella
86-003037
Trifur
86-003037
Sebastiscus marmoratus
Acoustico-Lateralis System
86-002262
Immune Response
86-002478
Sound Production
86-002654
Semaprochilodus
Blood Chemistry
86-002550
Semotilus atromaculatus
Biomagnification
86-003143
Fecundity
86-003143
Heavy Metals
86-003143
Seriola labandi
Foods/Feeding
86-002800
Seriola quinqueradiata
Bacterial Diseases
86-002950
86-002953
Cage Culture
86-002109
Culture/Propagation
86-002109
Mocardia kampachi
86-002950
Parasites/Diseases
86-002950
86-002953
Vibrio
86-002953
Seriola rivoliana
Distribution/Geographical
86-002873
Serrabrycon
New Genus
86-002915
Serrabrycon magoi
Lepidophagy
86-002915
New Species
86-002915
Siganus oramin
Culture/Propagation
86-002105
Egg Collection
86-002105
Fingerling Production
86-002105
Sillago sihama
Salinity
86-002324
Silurus
Bacterial Diseases
86-002946

...CONTINUED...
Silurus
Flavobacterium
86-002946
Parasites/Diseases
86-002946
Silurus glanis
Formalin
86-003096
Sodium Chloride
86-003096
Solea solea
Culture/Propagation
86-002116
Digestive System
86-002329
Enzymes
86-002329
Sorubim lima
Life History/General
86-002665
Mimicry
86-002665
Sparidae
Reproduction
86-002751
Reproductive System
86-002751
Spawning
86-002751
Sparus auratus
Age/Growth
86-002434
Bioenergetics
86-002434
Culture/Propagation
86-002116
86-002138
Feeders
86-002138
Feeding Experiments
86-002138
Food Conversion Efficiency
86-002434
Swimbladder
86-002226
Sphoeroides maculatus
Life History/General
86-002699
Management/Research--Marine
86-002699
Spirinchus lanceolatus
Population Studies
86-002726
Squalus acanthias
Acidosis
86-002533
Biomagnification
86-003089
Blood Chemistry
86-002352
86-002443
86-002532
Calcium
86-002436
Cardio-Vascular System
86-002367
86-002523
Cataracts
86-003043
Excretory System
86-002377
86-002398
86-002461
Heavy Metals
86-003089

...CONTINUED...
Squalus acanthias
Hormones
86-002523
Integument
86-002565
Marking/Tagging
86-003230
Mercury
86-003089
Nitrogen Metabolism
86-002366
86-002443
Osmoregulation
86-002377
86-002398
Parasites/Diseases
86-003043
pH Regulation
86-002327
86-002461
86-002532
86-002533
Rectal Gland
86-002259
86-002338
86-002355
86-002364
86-002388
86-002422
86-002423
86-002435
86-002436
86-002441
86-002462
86-002519
86-002523
86-002579
Reproductive System
86-002442
Vision
86-002287
Stizostedion lucioperca
Bacterial Diseases
86-002964
Hemorrhagic Septicaemia
86-002964
Life History/General
86-002697
Parasites/Diseases
86-002964
Pseudomonas
86-002964
Stizostedion vitreum
Ammonia
86-003128
Commercial Fishing
86-002736
Exploitation Rates
86-002737
Parasites/Diseases
86-002937
Population Studies
86-002736
86-002737
Stizostedion vitreum vitreum
Culture/Propagation
86-002133
Diets
86-002133
Exploitation Rates
86-003288
Feeding Experiments
86-002133
Feeds
86-002133

...CONTINUED...
Stizostedion vitreum vitreum
Fry Production
86-002133
Harvest
86-003288
Management/Research--Lakes
86-003288
Population Studies
86-003288
Pulse Fishing
86-003288
Stomias
Taxonomy
86-002894
Synaphobranchus kaupi
Lophoura gracilis
86-003020
Parasites/Diseases
86-003020
Parasitic Copepods
86-003020
Syngnathidae
Brooding Behavior
86-002630
Syngnathus floridae
Foods/Feeding/Selectivity
86-002788
Predator/Prey Relationships
86-002788
Takifugu rubripes
Epitheliocystis
86-002981
Parasites/Diseases
86-002981
Protozoan Diseases
86-002981
Tetraputurus audax
Biomagnification
86-003071
Heavy Metals
86-003071
Mercury
86-003071
Selenium
86-003071
Thalassoma bifasciatum
Early Development
86-002283
Metamorphosis
86-002283
Population Studies
86-002740
Theragra chalcogramma
Age/Growth
86-002827
Mortality Factors
86-002884
Predator/Prey Relationships
86-002884
Thermarces
New Genus
86-002909
Thermarces andersoni
New Species
86-002909
Thermarces cerberus
New Species
86-002909
Thunnus albacares
Foods/Feeding
86-002800
Thunnus maccoyii
Management/Research--Marine
86-003272
Thunnus thynnus
Biomagnification
86-003062

...CONTINUED...
Thunnus thynnus
Cadmium
86-003062
Copper
86-003062
Heavy Metals
86-003062
Iron
86-003062
Lead
86-003062
Zinc
86-003062
Thymallus arcticus
Marking/Tagging
86-003228
Thymallus thymallus
Fry Emergence
86-002764
Karyotypes
86-002614
Light
86-002764
Movements
86-002764
Tilapia
Culture/Propagation
86-002021
86-002087
86-002130
86-002131
86-002166
Diets
86-002166
Feeding Experiments
86-002166
Feeds
86-002166
Fertilization/Soil and Water
86-002130
86-002131
Nutrition
86-002166
Polyculture
86-002087
Pond Culture
86-002087
Tilapia aurea
Culture/Propagation
86-002072
86-002100
86-002161
86-002651
Hybridization
86-002581
Light
86-002433
Noise
86-002651
Nutrition
86-002161
Polyculture
86-002072
Pond Culture
86-002072
Reproduction
86-002433
Sewage Effluents
86-002100
Sonic Stimuli
86-002651
Stress
86-002428
Temperature
86-002428
...CONTINUED...
Tilapia aurea
Temperature
86-002581
Vitamins
86-002161
Tilapia guineensis
Brackishwater Culture
86-002117
Cage Culture
86-002117
Culture/Propagation
86-002117
Tilapia hornorum
Culture/Propagation
86-002154
Diets
86-002154
Feeding Experiments
86-002154
Hybridization
86-002154
86-002581
Temperature
86-002581
Tilapia mossambica
Hybridization
86-002581
pH
86-003090
Temperature
86-002581
Tilapia nilotica
Aeromonas hydrophila
86-002966
Amino Acids
86-002507
Bacterial Diseases
86-002966
Carotenoids
86-002463
Culture/Propagation
86-002154
86-002164
Diets
86-002154
Feeding Experiments
86-002154
86-002164
Hybridization
86-002154
Life History/General
86-003285
Management/Research--Lakes
86-003285
Nutrient Requirements
86-002507
Nutrition
86-002164
Parasites/Diseases
86-002966
Tilapia zilli
Parasites/Diseases
86-002993
Viral Diseases
86-002993
Tilapia zillii
Life History/General
86-003285
Management/Research--Lakes
86-003285
Tinca tinca
Blood Chemistry
86-002416
Hypoxia
86-002415

...CONTINUED...
Tinca tinca
Hypoxia
86-002416
Respiratory System
86-002415
Torpediniformes
Distribution/Geographical
86-002864
Torpedo
Distribution/Geographical
86-002864
Electric Organs
86-002297
Electrophysiology
86-002569
Torpedo marmorata
Copper
86-003088
Defensive Behavior
86-002629
Electroshock
86-002629
Heavy Metals
86-003088
Pigments
86-002291
Predator/Prey Relationships
86-002629
Trachinotus carolinus
Cage Culture
86-002027
Culture/Propagation
86-002027
Heated Water
86-002027
Power Plant Effluents
86-002027
Trachinotus falcatus
Foods/Feeding
86-002783
Predator/Prey Relationships
86-002783
Trachurus japonicus
Biochemical Composition
86-002447
Lipid Content
86-002447
Trachurus symmetricus
Starvation
86-002542
Trichogaster
Aquariums
86-002174
Culture/Propagation
86-002174
Tripterygion capito
Locomotion
86-002638
Tripterygion varium
Locomotion
86-002638
Trisopterus luscus
Lernaeocera lusci
86-003011
Parasites/Diseases
86-003011
Parasitic Copepods
86-003011
Umbra pygmaea
Life History/General
86-002681
pH
86-002681
Valencia bispanica
Electrophoresis
86-002594

...CONTINUED...
Valencia bispanica
Polymorphism
86-002594
Vimba vimba
Embryology
86-002240
Temperature
86-002240
Xiphias gladius
Biomagnification
86-003071
Gonosomatic Index
86-002761
Heavy Metals
86-003071
Mercury
86-003071
Selenium
86-003071
Sex Ratios
86-002761
Xyrauchen texanus
Temperature
86-002632
Temperature Selection
86-002632
Zacco temmincki
Pigments
86-002410

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